

TECHNOLOGY DEPARTMENT

The

# Refrigeration Service Engineers

LIBRARY  
SEP 30 1948

you can

erman

ers con-

ce men

— they

dials are

pounds

wdriver.

he dials

Electric

ERS

IGERATION  
NG AND  
ITIONING

1st Eastern Refrigeration-Air Conditioning  
Educational Exhibit and Conference

Oct. 8, 9, 10

Boston

erman

ers con-

ce men

— they

dials are

pounds

wdriver.

he dials

Electric

ERS

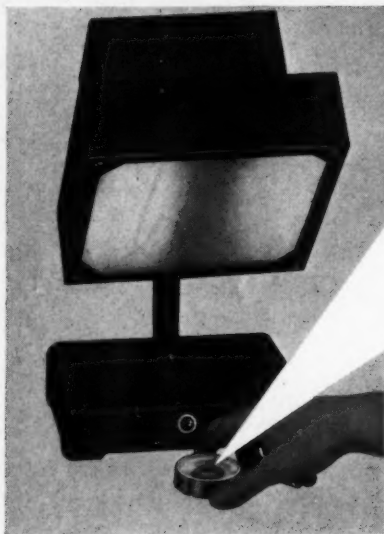
IGERATION  
NG AND  
ITIONING

SEPTEMBER

1948

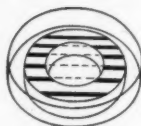
Vol. 16 No. 9

# CHICAGO SEALS



INSPECTED UNDER A  
MONOCHROMATIC LIGHT  
FOR FLATNESS TO

MILLIONTHS OF AN INCH



PERFECT



IMPERFECT

The science of precision checking provides a method of inspecting seal faces through the use of a monochromatic light and optical flat. The illustrations above show the light-bands reflected on the seal surface under test.

**FOR BETTER PERFORMANCE USE**

**CHICAGO  
VALVE PLATES**

SOLD THROUGH LEADING



**CHICAGO  
SEALS**

REFRIGERATION WHOLESALERS  
Send for Bulletin 802

**CHICAGO SEAL CO.**

332 S. HOYNE AVE.  
CHICAGO 12, ILL.

THE REFRIGERATION SERVICE ENGINEER, Nickerson & Collins Co., Publishers, 433-435 N. Waller Ave., Chicago 44, Ill. Published monthly. Vol. 16, No. 9, September, 1948. Entered as second-class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Additional entry at Beloit, Wis., April 15, 1948. Copyright 1948. Subscription in the U. S. \$3.00 per year, other countries \$4.00.

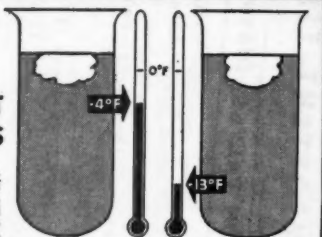
## The Ansul Research Staff

CONTINUING REPORT ON:

# WAX SEPARATION FACTS

## SAME OIL but DIFFERENT SHIPMENTS

An example of wax separation in two samples of presumably the same oil. Both tests were prepared with a 10 per cent concentration of oil in the refrigerant. Sample on the left separated wax at  $-4^{\circ}$  Fahrenheit while the sample on the right did not separate wax until  $-13^{\circ}$  Fahrenheit. In purchasing oil for low temperature refrigeration, specify wax separation temperature.



by the  
Ansul  
Wax-Oil  
Separation  
Method

● The temperature at which wax separates from an oil in oil-refrigerant mixture is influenced by three determining factors:

1. The nature of wax in the oil.
2. The amount of wax in the oil.
3. The amount of oil in the oil-refrigerant mixture.

Different oils possess different wax separation characteristics.

The nature and amount of wax content varies in different oils and may even vary in different samples of supposedly the same oil taken from different shipments.

These inconsistencies confuse the engineer in his efforts to select or recommend suitable lubrication for low temperature refrigerating systems and, to

alleviate this condition, Ansul Chemical Co. is ready and anxious, at all times, to co-operate with refrigeration engineers and refrigeration service engineers.

## REMEDIES

To eliminate wax trouble in expansion valves and coils:

1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve.
2. Install an oil trap to cut down the amount of oil (and consequent wax) circulating with the refrigerant.

**ANSUL WHOLESALERS** are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

### FOR EXAMPLE:

Samples of ice machine oils, submitted by users of Ansul Refrigerants to Ansul Wholesalers are tested by Ansul laboratories without charge by the Ansul Wax-Oil Separation Method. This approved method, developed and standardized especially for use in connection with oils used in refrigerating systems, provides an accurate determination of the temperatures at which wax separates from an oil-refrigerant mixture.



### SEND FOR THIS BULLETIN

An informative reprint, "The Separation of Wax from Oil-Refrigerant Mixtures," will be sent on request. No obligation. Just address...

\*REG. U. S. PAT. OFF.



ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

# ANSUL CHEMICAL COMPANY

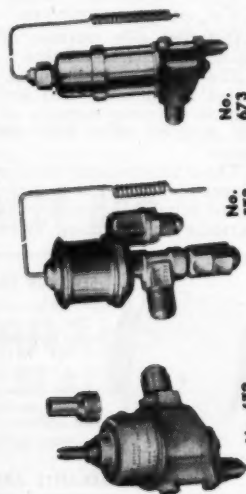
REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S "FREON 11," "FREON 12," "FREON 21," "FREON 22," "FREON 113" AND "FREON 114"

# "DETROIT" REFRIGERATION ACCESSORIES

Assure Complete Satisfaction

## EXPANSION VALVES — DISTRIBUTORS



No. 672  
 "Detroit" Automatic  
 Expansion Valve

No. 573

"Detroit" Thermostatic Expansion Valves

No. 673

# Check THESE IMPORTANT FEATURES

## EXPANSION VALVES — DISTRIBUTORS

Complete range of capacities up to 20 tons  
 Freon-12. Gas-charged power elements—quick  
 response—prevent motor overload. Diaphragm  
 and bellows types. Operating characteristics for  
 all applications.

### CAPACITIES—Freon 12

No. 672.....	.35 to 3.6 tons
No. 573.....	.5 tons
No. 673.....	1.2 to 3.6 tons
No. 899.....	1.6 to 6.0 tons
No. 786.....	.3 to 6 tons
No. 787.....	.6 to 11 tons
No. 788.....	.12 to 20 tons

(No. 899, 786, 787, and 788 have  
 external equalizer connection.)

These are representative of the large number of  
 valves in the "Detroit" line. Distributors are used  
 with large valves to serve multiple refrigerant  
 lines. No. 790 is available with flange or union



valves in the "Detroit" line. Distributors are used with large valves to serve multiple refrigerant lines. No. 700 is available with flange or union

Expansion Valve

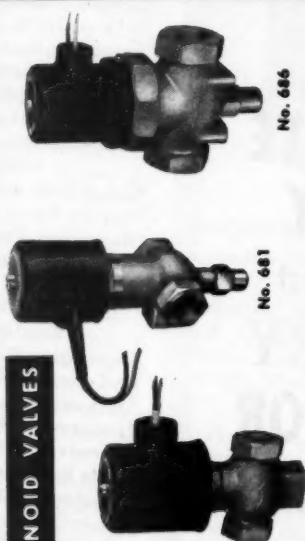


No. 700  
"Detroit"  
Distributors

No. 899  
"Detroit" Thermostatic Expansion Valves

No. 786-787-788  
"Detroit" Thermostatic Expansion Valves

### SOLENOID VALVES



No. 683-3

No. 681

No. 686

"Detroit" Solenoid Valves

### SOLENOID VALVES

Wide range of sizes for liquid line, suction line and water service. "Detroit" Solenoid Valves are quiet, compact and powerful. They may be used with any liquid that will not attack brass.

#### CAPACITIES—Freon-12 (2 lb. pressure drop)

No. 683-3, orifice $\frac{1}{8}$ "	.....1 $\frac{1}{4}$ tons
No. 683-3, orifice $\frac{1}{4}$ "	.....3 tons
No. 683-3, orifice $\frac{3}{8}$ "	.....3 $\frac{1}{2}$ tons
No. 681, orifice $\frac{1}{8}$ "	.....7 $\frac{1}{4}$ tons
No. 686, orifice $\frac{1}{8}$ "	.....11 tons
No. 686, orifice $\frac{1}{4}$ "	.....17 tons

All capacities are for liquid line.

No. 681 is pilot operated requiring a minimum pressure drop of only one psi on refrigerant to operate the piston. No. 686 is a heavy duty, large capacity pilot operated valve which requires a pressure drop of only 1  $\frac{1}{2}$  psi on refrigerant, 5 psi on water to operate the piston.

5128

## DETROIT LUBRICATOR COMPANY

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION  
GENERAL OFFICES:  
5900 TRUMBULL AVENUE • DETROIT 8, MICHIGAN

Canadian Representatives—Railway and Engineering Specialists Limited, Montreal, Toronto, Winnipeg



"DETROIT"

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Fleet Valves and Oil Burner Accessories  
"Detroit" Expansion Valves and Refrigeration Accessories  
Stationary and Locomotive Lubricators

SERVICE ENGINEER

# **CROSLEY**

*Twice Tested*

## **REFRIGERATION PARTS**

**for general replacement**



**IMMEDIATE  
DELIVERY**

**from your nearest**

**CROSLEY  
DISTRIBUTOR**

**listed to the right**

\*Indicates distributors equipped to furnish complete repair service on Crosley Hermetically Sealed Refrigeration Systems.

Write your distributor for free Crosley Service Parts Catalog.

Albany, New York . . . . . Roskin Bros.  
\*Amarillo, Texas

Domestic Appliance Dist.

\*Atlanta, Georgia . . Georgia Appliance  
\*Baltimore, Maryland Legum Distributing  
\*Birmingham, Ala. Alabama Service Co.  
\*Boston, Mass. . . . . Wahn Distributors  
\*Buffalo, N. Y. . . . . Western Mdse. Distrs.  
\*Bristol, Tenn.-Va. Interstate Hardware Co.  
Carrier Mills, Ill. . . O'Keefe Distributing  
\*Charlotte, N. C. . Carolinas Auto Supply  
\*Chicago, Illinois . . Harry Alter & Bros.  
\*Cincinnati, Ohio . . Modern Distributing  
Clarksburg, W. Va. . . Utility Co., Inc.  
\*Cleveland, Ohio . . Frankelite Company  
\*Columbus, Ohio Miami Valley Dist. Co.  
\*Dallas, Texas . . Lone Star Wholesalers  
\*Davenport, Iowa . . Sieg Home Supply  
\*Dayton, Ohio . . . . Miami Valley Dist.  
\*Denver, Colo. . Graybar Electric Co., Inc.  
\*Des Moines, Iowa . . H. E. Sorenson Co.  
\*Detroit, Mich. . . . . Peninsular Dist. Co.  
El Paso, Texas . . . . Vaughan Appliance  
\*Fargo, N. D. . . . . Meyers-Taube Co.  
Ft. Smith, Arkansas Eads Bros. Furniture  
Ft. Wayne, Indiana . . R. M. Kaough Co.  
\*Ft. Worth, Texas. United Appliance Co.  
\*Grand Rapids, Mich.

Independent Distributors, Inc.

\*Great Falls, Mont. . . Gt. Falls Paper Co.  
\*Harlan, Ky. . . . . Kentucky Mine Supply  
\*Harrisburg, Pa. . . . Jules Alexandre, Inc.  
Hastings, Nebraska . . . Dutton-Lainson  
\*Hazleton, Pa. . . . . Lehigh Valley Dist.  
\*Houston, Texas

Reader's Wholesale Distributors

\*Huntington, W. Va. Huntington Wh'e Furn.  
\*Indianapolis, Ind. . . Capital Paper Co.  
\*Jackson, Miss. . . . Southern Wholesalers  
\*Jacksonville, Fla. Graybar Elec. Co., Inc.  
\*Kansas City, Mo. . . . Superior Distr. Co.  
\*Little Rock, Ark. . . . Wright Service Co.  
\*Los Angeles, Calif. . . J. N. Ceazan Co.  
\*Louisville, Ky. . . . . Cooper-Louisville  
Manitowoc, Wis. . . . J. J. Stangel Hdwe. Co.  
\*Memphis, Tenn. . . . . National Rose Co.  
Miami, Fla. . . . Graybar Electric Co., Inc.

- \*Milwaukee, Wis. . . . Greusel Distr. Co.
- \*Nashville, Tenn. . . . Nashville Chair Co.
- \*Newark, N. J. . . . Apollo Service, Inc.
- New Haven, Conn. H. M. Tower Corp.
- \*New Orleans, La.

Woodward, Wight & Co.

- \*New York, N. Y. . . . Crosley Distr. Corp.
- \*Omaha, Nebr. Electric Fixture & Supply
- Orlando, Fla. . . . Graybar Elec. Co., Inc.
- \*Peoria, Illinois. . . . Johnston-Moody Co.
- \*Philadelphia, Pa. . . . Judson C. Burns, Inc.
- \*Phoenix, Arizona Appliance Distributors
- Pittsburgh, Pa. Pittsburgh Products Co.
- Portland, Maine Graybar Elec. Co., Inc.
- \*Portland, Ore. . . . Fields Sales Company
- Providence, R. I. Graybar Elec. Co., Inc.
- Quincy, Illinois. . . . Tenk Hardware Co.
- Reno, Nev. . . . Heat & Air Cond. Supply
- \*Richmond, Virginia. Louis O. Bowman
- \*Roanoke, Va. . . . Richardson-Wayland
- Rochester, N. Y. . . . O'Donnell-Dunigan
- Saginaw, Mich. J. Geo. Fischer & Sons
- \*Salt Lake City, Utah Western Supply Co.
- \*San Antonio, Texas Alamo Distributing
- \*San Francisco, Calif. California Electric
- Savannah, Georgia. . . . Frank Corp.
- \*Seattle Wash. . . . Commercial Appliance
- Shreveport, La. . . . Electric Supply Co.
- \*Sioux Falls, S. D. . . . Power City Radio
- South Bend, Ind. . . . The Ridge Company
- \*Spokane, Wash. . . . Standard Sales Co.
- \*Springfield, Ill. . . . Central Ill. Wholesalers
- Springfield, Mass. . . . Tarbell-Watters
- \*Springfield, Mo. . . . Rogers & Baldwin
- \*Sterling, Illinois. . . . Hardware Products
- \*St. Louis, Missouri. . . . ARA Distributing
- \*St. Paul, Minn. Motor Power Equip. Co.
- \*Syracuse, N. Y. . . . O'Donnell Distributors
- Tampa, Fla. . . . Graybar Elec. Co., Inc.
- \*Toledo, Ohio

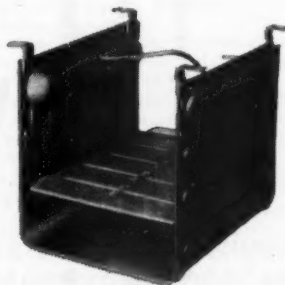
Walding-Kinnan & Marvin Co.

- \*Tulsa, Oklahoma Tom P. McDermott, Inc.
- Tucson, Arizona Appliance Distributors
- \*Washington, D. C. American Wholesalers
- Watertown, S. D. . . . Lyle Meyers
- Wichita, Kansas. . . . Loyal Distributors
- \*Youngstown, Ohio. . . . Dorrance Supply



**LOOK FOR** this emblem on the outside of every package of refrigeration parts you buy. It's your guarantee of quality parts *inside*.

#### GENERAL REPLACEMENT EVAPORATORS FOR ALL KINDS OF REFRIGERANTS



**Designed for hi-side float, capillary or expansion valve liquid feed systems**

Leakproof hydrogen brazed construction. Durable, clean, rust proof. Continuous refrigerant passage tubing through shell. Universal mounting for easy, quick installation.

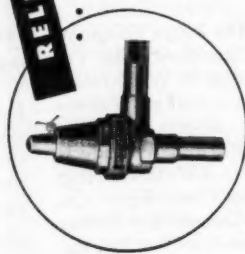
*Illustrated:* Model 16S for 7 & 8 cu. ft. cabinets: Your cost—only \$10.43. Suggested list, \$14.90. Models available for 4 & 5 and 5 & 6 cu. ft. cabinets. Immediate delivery. Order from your Crosley distributor.

## CROSLEY

Division—*AVCO* Manufacturing Corporation  
Cincinnati 25, Ohio

**I**n order to eliminate expensive "callbacks,"  
many service men and contractors  
standardize on Henry Products.

**RELIEF VALVES**



For relieving to atmosphere or to low side of system. Initial leak pressures 90 to 300 p.s.i. Conventional and diaphragm types. Fast accurate reseating. Complete range of sizes from 1/8" thru 2". Furnished for all refrigerants.



Sold by leading wholesalers

**HENRY VALVE COMPANY**

Control Devices, Valves, Driers, Strainers and Accessories for Refrigeration and Air Conditioning and Industrial Applications.

3260 W. Grand Ave., Chicago 51, Ill. • Cable: HEVALCO Chicago

**FEATURES** are important

...but it's

# PERFORMANCE

*that really counts!*

**That is why Engineers  
Specify Spörlan  
for Peak Performance on All Installations!**

**You can easily see SIX of the  
seven important features of the Spörlan  
Type G Thermostatic Expansion Valve**

1. Stainless steel diaphragm atomic hydrogen welded in steel housing
2. New Spörlan decal name plate gives complete valve specifications at a glance
3. Triangular push rods effectively reduce friction and chance of moisture freezing rods in guides
4. New pin carrier design practically eliminates moisture problem normally occurring at valve pin
5. New reduced over-all length permits installing Type G valve in much smaller space
6. Easy accessibility. The Spörlan Type G Thermostatic Expansion valve can be quickly and easily taken apart for inspection and cleaning

**But the SEVENTH and exclusive  
Spörlan feature you cannot see!**

**C CHARGE**  
FOR  
suction temperatures  
**ABOVE ZERO**

**The SPÖRLAN  
SELECTIVE  
C or Z  
CHARGE**

**Z CHARGE**  
FOR  
suction temperatures  
**BELOW ZERO**

Other Spörlan peak performers include Catch-All Filter Driers, Solenoid Valves, Strainers, Solenoid Pilot Control, Refrigerant Distributors, and the only Thermostatic Expansion Valves with Selective Charges

When you add the Spörlan Selective Charge feature to the other six important Spörlan features, you add the **PERFORMANCE FACTOR** that puts Spörlan out in front in the thermostatic expansion valve field!

## SPÖRLAN

*For Peak Performance*

on all commercial refrigeration installations, be sure to specify Spörlan Type G thermostatic expansion valves with selective charges to your wholesaler

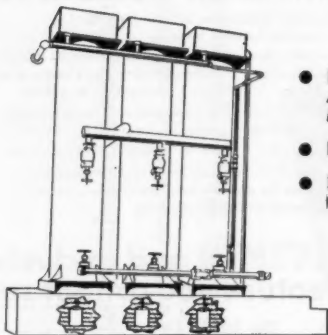
## VALVE COMPANY

7525 SUSSEX AVENUE • ST. LOUIS 17, MISSOURI

# The CSCO AQUATROL

A Simple But Very  
Efficient Device Designed To

## DESTROY ALGAE



- Helps to Prevent Further Accumulation of ALGAE, SLIME, SCALE and ENCRUSTING MATTER on Heat Exchange Surfaces
- Helps to Increase Volume of Production
- Helps to Decrease Percentage of Production Cost

In Air-Conditioning Systems, Cooling Towers, Spray Ponds, Cooling Water Circulation Systems, Air-Wash Systems, Barometric Condensers, Cooling sides of Evaporating Condensers, Ice Plants, Vertical Condensers, All Heat-Exchange

Systems, Cleaning Roots out of Pipe Lines.

AQUATROL consists of chemicals in a container which is to be placed in those parts of your cooling system affected by ALGAE, SLIME, SCALE AND ENCRUSTING MATTER. Water flowing through the container is treated with chemicals which are so perfectly balanced they convert the above mentioned destructive forces into precipitates which collect in the bottom of the cooling system and are easily removed. The flow of this chemically treated water may be regulated to avoid unnecessary waste.

CSCO AQUATROL eliminates the daily dosing of water with compounds . . . and needs no further attention other than to place new tablets in the device as needed. SAVES TIME! SAVES MONEY! SAVES LABOR! Protects and prolongs the life of equipment and helps the equipment give more efficient service!

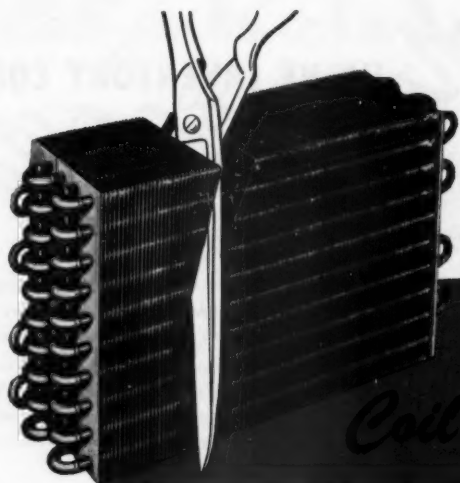
AQUATROL Outfit for small operation, \$15 f.o.b. Birmingham.  
For larger operations, \$25 f.o.b., Birmingham

### CHEMICAL SOLVENT COMPANY

3005—16th Street North

Birmingham, Ala.





**DON'T CUT**  
*Coil Capacity*

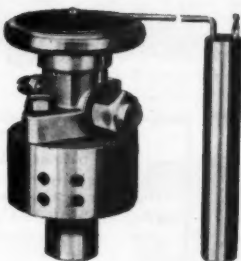
*Small*

## ALCO MULTI-OUTLET THERMO VALVES

Faulty feed that "starves" several circuits often cuts coil capacity  $\frac{1}{2}$  to  $\frac{1}{3}$ . Stop this costly waste with ALCO Multi-Outlet Thermo Valves. They assure:

- The refrigerant liquid is accurately metered at the point of expansion to all coil circuits
- Even distribution regardless of load changes
- Full rated coil capacity—no underfed circuits
- Positive, accurate control—no "hunting" or "cycling"
- Less running time—substantial savings in operating costs

Available at your wholesaler's for all refrigerants and applications:  $\frac{1}{2}$  to 50 tons FREON-12, 2 to 36 outlets. Ask for our Bulletin 180.



Designers and Manufacturer  
of Thermostatic Expansion  
Valves; Evaporator Pressure  
Regulators; Solenoid Valves;  
Float Valves; Float Switches.

**ALCO VALVE CO.**

857 KINGSLAND AVE. • ST. LOUIS 5, MO.

# Slash VALVE INVENTORY COSTS UP TO 900%



GENERAL CONTROLS engineering offers tremendous savings in inventory investment, stock space and handling costs.

For complete information on how to reduce your inventory costs with General Controls refrigeration valves request literature and see your refrigeration wholesaler.

◀ The new selective capacity cartridge provides instant sizing adjustment.

The unsurpassed control for refrigerants. V-200 Thermal Expansion Valves available in 1/2, 1, 2, and 5 ton body sizes and for Freon, Methyl Chloride, Sulphur Dioxide.

## COMPARE THESE FACTS...

### ORDINARY VALVES

Separate valves for each back pressure or suction temperature range.  
Separate valves for each capacity size.

### GENERAL CONTROLS V-200 VALVES

One valve for ALL back pressure or suction temperature ranges.  
One valve with selective cartridge for full range of capacities.

54-1

For Full Capacity Range in each body size at all back pressures with any one refrigerant  
**ONLY One VALVE REQUIRED FOR COMPLETE INVENTORY**

NATIONALLY DISTRIBUTED BY REFRIGERATION WHOLESALEERS

Cut Costs... Increase Profits with

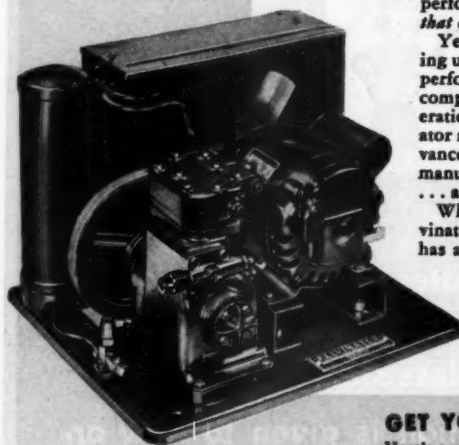
## GENERAL CONTROLS

*Manufacturers of Automatic Pressure, Temperature & Flow Controls*

FACTORY BRANCHES: Birmingham (3), Boston (16), Chicago (5), Cleveland (15), Dallas (2), Denver (10), Detroit (8), Glendale (1), Houston (2), Kansas City (2), New York (17), Philadelphia (40), Pittsburgh (22), San Francisco (7), Seattle (1), Oklahoma City (1) • Distributors in Principal Cities

# Call for **Kelvinator** on all three counts!

1. **TROUBLE-FREE PERFORMANCE**
2. **USER ACCEPTANCE**
3. **COMPETITIVE PRICE**



You're sure to be right on *all three counts* . . . when you buy Kelvinator condensing units. They're priced *competitively* . . . they perform *dependably* . . . and they bear a name that customers know means quality.

Yes! In production, Kelvinator condensing units are precision-tested to insure *peak* performance under all conditions. Their complete *dependability* is known by refrigeration men everywhere, just as the Kelvinator name is always known for the most advanced refrigeration design and quality manufacture. It's the name that always *sells* . . . always satisfies!

Whatever your needs, call on one of Kelvinator's 50 convenient supply depots. Each has a *complete* stock of refrigeration parts and supplies, *competitively* priced. And you'll like Kelvinator's fast, friendly service . . . Kelvinator Division, Nash-Kelvinator Corporation, Detroit, Michigan.

## GET YOUR COPY!

Here's a new catalog for the *quick, easy* way to buy refrigeration parts and supplies. All information and prices are grouped for easy reference. Ask for it at your local Kelvinator Distributor's or Zone Office.



# Kelvinator

CONDENSING UNITS  
REFRIGERATION PARTS AND  
SUPPLIES



BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS

FOR MAXIMUM  
REFRIGERATING EFFICIENCY

*Specify*

# STANGARD

PRIME SURFACE COLD PLATES



- STANGARD plates are made for various applications, in any size, shape or form, including stainless steel —
- PROMPT attention is given to new orders, with delivery schedules assured —

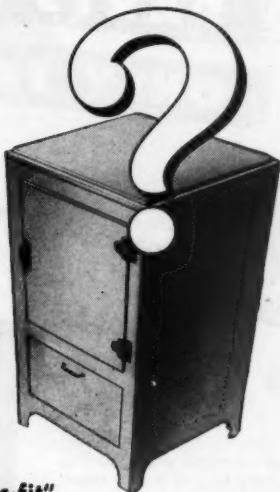
FOR DETAILS  
WRITE

## STANGARD

46-76 Oliver Street • Newark 5, N. J.



*You name it*



**Cutler-Hammer makes a "specific-fit" replacement unit for each of more than 1,000 refrigerator models.**

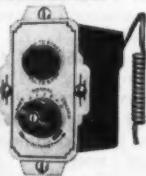
Take a look at these... just a few of the "specific-fit" controls in the unequalled Cutler-Hammer line.

No "modifying", no fussing, no delay when you answer service calls with C-H "specific-fit" replacement control units. You take out the old, put in the new... and you are through! It's the easy, sure way to do the job *right* because Cutler-Hammer has manufactured such "specific-fit" units for more than 1,000 models of refrigerators built since 1925. And you'll also quickly see how the widely-known Cutler-Hammer name (advertised in The Saturday Evening Post, Time, Newsweek, American Home, Better Homes & Gardens, House & Garden, etc.) builds customer confidence and good will. The C-H refrigeration control catalog, as well as the items you need, are available through your authorized C-H refrigeration wholesaler. Do not forget, this C-H refrigeration control line includes the popular *general purpose* two-button replacement unit (Type 9502) which incorporates dependable motor overload protection. CUTLER-HAMMER, Inc., 1353 St. Paul Ave., Milwaukee 1, Wisconsin.

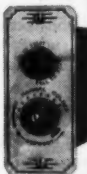
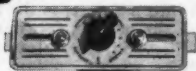


9502N303 C-H "specific-fit" for  
Capeleed 1937-38 models

9502N372 C-H "specific-fit" for  
Kelvinator  
1932 models



9502N453 C-H "specific-fit" for  
Stewart-Warner  
1937 models



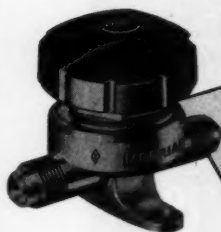
9521N20 C-H "specific-fit" for  
Frigidaire  
1936-37-38 models

9502N95 C-H  
"specific-fit" for  
Tagliabue  
models

Featured by Cutler-Hammer refrigeration wholesalers and recommended by alert service dealers from coast to coast.

# 5

## PARTS IN ALL . . . ONLY TWO THAT MOVE



**IMPERIAL  
DIASeal  
VALVE**

- NO SPRINGS
- "EITHER-WAY" FLOW

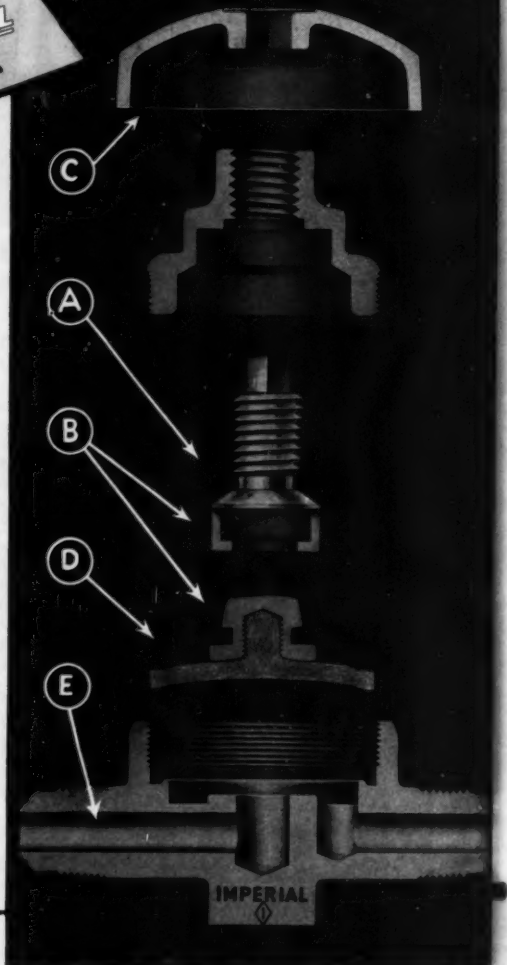
Talk about simplicity, the DiaSeal Valve is streamlined right down to five essential parts, *only two of which move*—to give unsurpassed performance throughout long life.

This simplicity of design, readily apparent in the illustration, incorporates features that make the DiaSeal the outstanding valve for refrigeration service:

- A. NO SPRINGS**—DiaSeal Valve cannot "stick shut" because diaphragm is lifted mechanically. Positive control with flow in either direction.
- B. ONLY TWO MOVING PARTS**—Simple construction assures greater dependability.
- C. EASY FINGER-TIP ACTION**—Quick, sure opening and closing with less than two turns of handle.
- D. LONG LIFE DIAPHRAGM** is impervious to all common refrigerants. In actual tests, has withstood over 1,000,000 openings and closings under refrigerant pressure.
- E. INLET AND OUTLET PORTS IN LINE.** Simplifies installation.

Both internal parts of the DiaSeal lift out with the bonnet, facilitating soldering in line. Extremely low height cuts installation space.

Furnished in 2-way and angle types, with either flare or solder connections. The Imperial Triple Seal Groove is an added feature on flare connections  $\frac{3}{8}$ " and larger.



THE IMPERIAL BRASS MFG. CO.  
534 S. Racine Ave., Chicago 7, Ill.

ASK FOR BULLETIN 103-REF

SEE YOUR JOBBER

# IMPERIAL

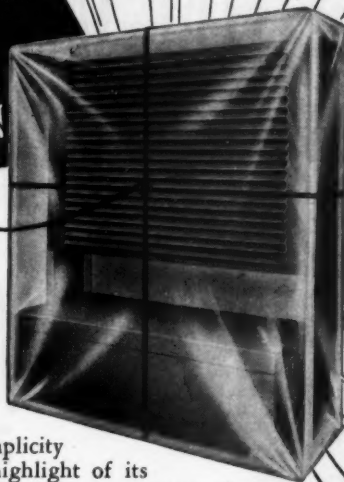
FITTINGS • VALVES • FILTERS • DEHYDRATORS  
FLOATS • CHARGING LINES • TOOLS FOR CUTTING,  
FLARING, BENDING, PINCH-OFF AND SWEDGING.



# Pakaged REFRIGERATION

The NEW  
**KOLD HOLD *Pakage* TRUCK  
UNIT for HIGH TEMPERATURE  
REFRIGERATION of PERISHABLES . . .**

The New Kold-Hold Package Refrigeration Unit means lower costs . . . added dividends to you. Its simplicity of installation and operation is the highlight of its success wherever high temperature perishables are transported by truck. Check the following features of the New KOLD-HOLD PAKAGE REFRIGERATION UNIT.



Self-contained, adjustable to almost any truck. The Unit can be lowered to 46 1/4" for installing through truck door. When installed, height can be adjusted for 57" minimum to 78" maximum heights.



The electrically driven compressor builds up a charge of flint ice in the "Hold-Over" Plates, which provides ample refrigeration over a day's run.

Operates efficiently, economically in any properly insulated truck, regardless of age.

Easily installed — simply cut intake and discharge holes, push into place, plug into any 110AC-60 Cycle Circuit\*.

Maintains inside truck temperatures of 45° F. to 50° F. over a full day's run.

Provides ample refrigeration even in extreme weather conditions.

The 1 HP Compressor operates for a few cents a day.

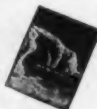
Recharging plates at any electrical outlet protects loads on long runs.

Dry and odorless — no bother. Dependability at lower cost.

Kold-Hold "Hold Over" Refrigeration Plates such as used in this unit have given satisfactory service for over 15 years.

\*A 220V-60 Cycle Single Phase motor can be supplied on request.

Write for Complete  
Catalog Today



## KOLD-HOLD

Jobbers in Principal Cities

**KOLD-HOLD MANUFACTURING CO.,**  
SERVICE ENGINEER

**PROCESSING** **TRANSPORTATION**  
protects every step of the way

**STORAGE**  
502 E. Hazel St., Lansing 4, Michigan

September, 1948

# NATION-WIDE SERVICE ON SMITHway MOTORS

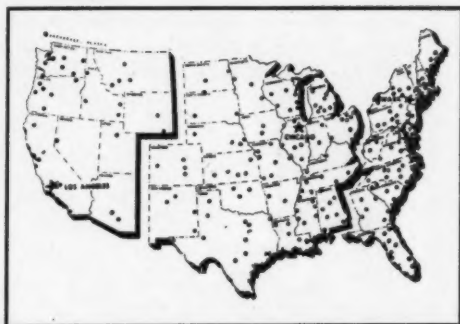
## 24-HOUR "OFF-THE-SHELF" SERVICE NOW AVAILABLE IN ALL PARTS OF THE U.S.

Three conveniently located factory warehouse and service branches, linked with over 200 authorized dealer service stations across the nation, give you faster, country-wide service on all SMITHway Motors.

You get the *finest service* through qualified high-standing local shops... and you get the *finest parts*, warranted-factory-inspected SMITHway parts. Servicing and repair are done to factory-established SMITHway standards.

And you get the fastest and lowest-cost service: two other good reasons for choosing SMITHway Motors!

For additional information, write your nearest A. O. Smith Product Service Division branch.



3 FACTORY WAREHOUSE AND SERVICE BRANCHES—Los Angeles, Chicago and Newark—plus more than 200 dealer service stations, enable the Product Service Division to speed your order *today!*



## A. O. SMITH

Corporation

### PRODUCT SERVICE DIVISION\*

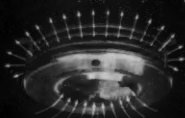
**EASTERN**  
113-115 Frelinghuysen Ave.  
Newark 5

**CENTRAL**  
8313 South Chicago Ave.  
Chicago 17

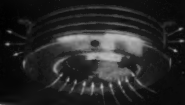
**WEST COAST**  
1637 N. Spring St.  
Los Angeles 12

\*Also serving these SMITHway Products: Water Heaters, Liquid Gas Systems, Vertical Turbine Pumps, Stokers, SMITHway-Burkay Water Heaters and Burkay Heating Equipment

# Choice of the Field!



Upper illustration: Standard Dome Cooler with air emitting in all directions.



Lower illustration: Two-way Dome Cooler with air flow limited to two directions.

## PEERLESS *DOME* COOLER

● For top performance in reach-in and walk-in coolers, install the PEERLESS DOME COOLER, the motor-driven cooling coil with a long history of satisfactory service. In the new, improved 1948 model you have the finest performance yet in this type of cooling coil. It's easily installed and occupies minimum space. The handsome spun aluminum casing holds precision-engineered parts which insure dependable, trouble-free operation. Air is drawn up in the center of the unit, cooled, and discharged horizontally along the fixture ceiling to drop down the side walls. This efficient, constant cooling cycle maintains high humidity, keeping stored products at the peak of their quality. Use PEERLESS motor-driven cooling coils. You'll find that today's outstanding cooling coils are PEERLESS-MADE!

**CASCADE COOLER** This motor-driven coil combines radiant and convection cooling. Even the ornamental casing is a cooling surface! Cold air cascades downwardly from the face of the unit, which hugs the wall, saving storage space.

**UNIT COOLER** This is the new PEERLESS "PIE PLATE" with all primary and secondary surfaces IN THE AIR STREAM. There is no waste surface in this condensed package of refrigeration power.

FOR BOX TEMPERATURES ABOVE 32°  
FOR USE WITH FREON, METHYL CHLORIDE  
AND SULPHUR AS REFRIGERANT  
SEND FOR ENGINEERING DATA AND PRICE LISTS



**PEERLESS of AMERICA, Inc.**  
2901 LAWRENCE AVE. CHICAGO 25, ILLINOIS, U.S.A.



CASCADE COOLER



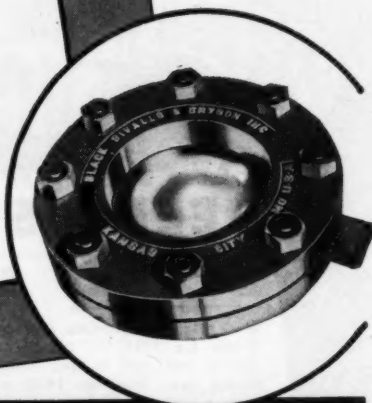
UNIT COOLER

# PREVENT OVER-PRESSURE TROUBLE

*in your  
refrigeration  
units*

*with*

## BS&B SAFETY HEADS



Protect receivers and copper tubing from rupture. Save compressors from destructive over-pressure. SAFETY HEADS offer that positive margin of safety that prevents such accidents. Eliminate costly equipment losses . . . save on costly shut-downs. The simple rupture disc of the SAFETY HEAD absorbs the shock of over-pressure . . . bursts in tension at pre-set pressure.

SAFETY HEADS provide a full-throated, pipe-sized escape point. Fractured discs are easily, quickly replaced. Tamper-proof, fool proof SAFETY HEADS offer you guaranteed performance. A wide selection of types assures you of tailor-made protection. Write today for complete details. Address Special Products Division, Black, Sivalls & Bryson, Inc., Power and Light Building, Kansas City 6, Mo.



FOREIGN INQUIRIES INVITED

Cable Address: BLACK, KANSAS CITY, U.S.A.

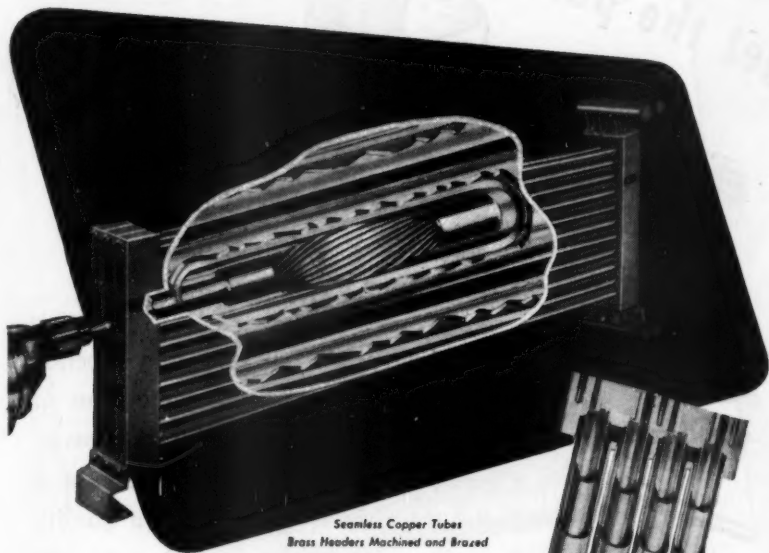
### BLACK, SIVALLS & BRYSON, INC.

KANSAS CITY, MO.

OKLAHOMA CITY, OKLA.

# NEW UNIT EFFICIENCY *always* with **(HM)** CLEANABLE CONDENSERS

and the new two-stage design  
insures maximum heat transfer capacity



Seamless Copper Tubes  
Brass Headers Machined and Brazed

HM Cleanable Condensers can be maintained at "new-unit" efficiency and economy by regular and continued use of a standard cleaning tool. Water tubes are accessible at both ends—just loosen a few bolts and slide the end plates off—and there is nothing to obstruct the simple cleaning operation. Each quick cleaning operation takes only minutes, yet restores copper water surfaces to their original heat exchange efficiencies and adds months and years of the most efficient and economical service to the life of your refrigeration unit.

HM's new two-stage condenser design affords greater concentration of copper water-tube surfaces in the lower portion of the condenser. The smaller top water tubes allow ample refrigerant space, thereby eliminating resistance or pressure drop and affording the lowest possible head pressures. With this new construction, greatest-possible heat-transfer values are effected.

JOBBERS in all principal cities  
carry HM condensers in stock.

**HM**  
*Halstead & Mitchell*

OFFICES: Bessemer Building, Pittsburgh 22, Pa.

get the part that's **BUILT** for the Job



**ECCENTRICS**



**CONNECTING  
RODS**



**ECCENTRIC  
SHAFTS**



**VALVE PLATES**

**PISTON PINS  
VALVE REEDS  
RINGS  
DISCS**

**CALL YOUR  
DEHAVAN WHOLESALER  
FOR *Perfection*  
REPLACEMENT PARTS**

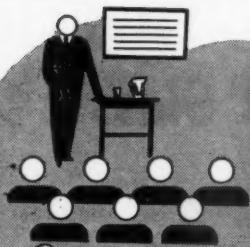
Your Delavan Wholesaler is a dependable source for the complete line of Delavan replacement refrigeration parts. He's pledged to service; represents a name that has long stood for a quality line of precision replacement parts. Be sure the part you order is precision-built to fit the job. Call your Delavan Wholesaler . . . specify DELAVAN Perfection Parts.

**DEHAVAN  
MANUFACTURING CO.**

3009 SIXTH AVE., DES MOINES 13, IOWA

**A COMPLETE LINE OF REFRIGERATION PARTS**





# Let's talk about Hot Air!

## THAWZONE DATA

It is difficult, if not impossible, to remove all traces of air from field-installed refrigerating systems, and from factory assembled units too. Residual air in a system in large amounts causes high head-pressure, but small amounts are not detectable by increased head-pressure. These smaller amounts, however, are the cause of serious trouble in refrigerating systems.

This air is **HOT AIR**. It traps in the condenser, where it is held at temperatures up to 200° F. or higher. At these temperatures the oxygen of the air is very reactive. It is in contact with small amounts of oil as well as refrigerant, and oxidizes them to compounds known as organic peroxides and acids. These compounds are corrosive and attack metals and form sludges.

# THAWZONE

PATENTED

The PIONEER FLUID DEHYDRANT

Entirely separate from its function as a moisture remover, THAWZONE is also a very effective oxygen scavenger. It not only has a catalytic effect in PREVENTING oxidation of the oil—an inhibitor action—but it also effectively REMOVES oxygen. THAWZONE "grabs" the oxygen before the oil does, and is converted to oil-soluble, non-corrosive, inert-reaction products of a type known chemically as aldol condensation products.

Many refrigeration troubles, commonly ascribed to moisture, are really due to air. THAWZONE effectiveness has helped refrigeration engineers for years.

## HIGHSIDE CHEMICALS CO.

195 VERONA AVE.

NEWARK 4, N. J.

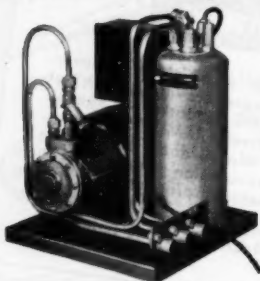
ALSO MAKERS OF

**TRACE**  
REFRIGERANT  
LEAK DETECTOR





## New TEMPRITE CARBONATOR achieves peak operating efficiency



MODEL CB-305 Temprite Packaged Carbonator is applied to existing cooling systems. Combination cooler-carbonator also available. Write for bulletins.

1. User gets up to 5620 glasses of highly carbonated water from a single tank of  $\text{CO}_2$  gas. This is equal to 281 glasses per pound of  $\text{CO}_2$  gas used.
2. No loss of  $\text{CO}_2$  gas through purging or venting.
3. Offers completely automatic carbonation for use in soda fountains, taverns, coin operated beverage dispensing machines, etc.
4. Operates independently of city water pressure.
5. Complete assembly, ready to install and mounted on a rigid steel base, includes pump and motor. Measures only 13" x 16". Fits in practically any location.
6. Stainless steel, long-life construction.

### TEMPRITE PRODUCTS CORP.

*Originators of Instantaneous*



*Liquid Cooling Devices*

45 PIQUETTE AVENUE

DETROIT 2, MICHIGAN

# DURO-CHROME

## REFRIGERATION TOOLS

### The Finest Set for the Best Service

57 pieces, including tube bender, tube cutter, flaring tool, slide wrenches, wheel puller, gas piers, refrigeration sockets and special reversible ratchet, etc. Sockets are **NOT** BROACHED, are cold formed, for perfect fit, for reaching the tight spots, and for extra strength.



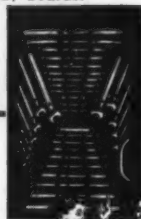
## TOOLS THAT MAKE THE MOST OF ANY MAN'S ABILITY

These bright chrome plated tools are so handsome that you are really impressed when you open this set. And the value of **Duro-Chrome** is more than skin deep! Pick up a **Duro-Chrome** Tool and the sleek finish, the balance and feel of it, will appeal to you. Put it to work and you'll know that here is a helper that will turn your skill to your greatest advantage and profit, day after day over the years. From materials to design, each **Duro-Chrome** Tool is built to do the job better, and easier for you than that job ever was done before. Buy the set complete, or assemble your set by getting several pieces at a time.

Plan your set from the colorful new **Duro-Chrome** Catalog ... **FREE**. Just Write. Either way, you're really in business when you're equipped with **Duro-Chrome**!



You'll find **Duro-Chrome** wrenches, chisels, screw drivers, tube cutters, refrigeration sockets and special reversible ratchet and all the other refrigeration service tools at your **Duro-Chrome** Dealer's. Look for the gold-and-black **Duro-Chrome** Display Boards!



R-2975



**DURO METAL PRODUCTS CO.,** 2649 North Kildare Ave., Chicago 39, Ill.

SERVICE ENGINEER

23

September, 1948

# TESTED...



End flange check. Inspector is measuring depth of lubricating pump plunger slot.

# TESTED...



3000 kilogram pressure tests hardness of crankshaft. Impression's diameter is then measured microscopically.

# TESTED...

## to back your recommendation of GENERAL ELECTRIC CONDENSING UNITS

Why does General Electric submit its equipment to such expensive, thoroughgoing tests?

Because G. E. wants the double-backed prestige of having not only the best line of products, but the knowledge that each product has received the best attention G. E. knows how to give.

Thus do we back up our own selling features: the new CW line includes units from  $\frac{1}{8}$  hp to  $\frac{1}{2}$  hp . . . 8 air cooled and 4 water cooled models . . .

integrated in 3 basic compressor sizes, many parts of which are themselves interchangeable. Even the advantages to you of easier selection, wide capacity range, and lower parts stock have paved the way for newer, stricter tests . . . giving you greater dependability than ever before. The pride G. E. takes in its quality control is your assurance of equipment whose quality is truly beyond the ordinary . . . and whose quality is constant! General Electric Company, Air Conditioning Dept., Section R-8129, Bloomfield, N. J.

**GENERAL  ELECTRIC**  
**Refrigeration Equipment**

Only

**THERMOBANK**

by **KRAMER**

*Keeps Coils Frost-Free  
Automatically  
at Any Temperature  
without..*

LABOR  
ATTENTION  
ELECTRIC HEATERS  
BRINE OR WATER SPRAYS



• Write for  
Bulletin R124

**KRAMER TRENTON CO. Trenton, N.J.**

# LEADERSHIP



THE BERYLLIUM  
COPPER  
POWER ELEMENT  
USED IN ALL  
RANCO CONTROLS

LOOK TO THE LEADER for the satisfactory performance and trouble-free service that pleases your customers and increases your profits. And look to Ranco, too, for the design developments that insure that performance and service. Every Ranco Refrigeration Control, for example, has the new and exclusive Ranco beryllium copper power element, designed and produced by Ranco refrigeration specialists, tested in thousands of war-time precision instruments and in over 2,000,000 refrigeration controls.

The maximum sensitivity and positive action of this new power element provides temperature accuracy within new lower limits. Precision built of the finest materials, each joint in this element is silver soldered, an operation typical of the sound design and skilled craftsmanship that marks every Ranco product. It pays to check with the leader first.

**✓ CHECK with *Ranco* FIRST**

Specialists In Refrigeration • More Ranco Controls In Use • Dependability • Less Stock To Carry • Greater Customer Satisfaction • More Profit For You

***Ranco Inc.***



COLUMBUS 1, OHIO

World's Largest Manufacturers of REFRIGERATION

CONTROLS



# THE REFRIGERATION SERVICE ENGINEER

The  
National Magazine  
of  
Refrigeration  
Sales, Service  
and Installation

Published Monthly by

NICKERSON & COLLINS CO.  
433-435 NORTH WALLER AVE.  
CHICAGO 44

Telephones Austin 1303-1304-1305

NEW YORK OFFICE

420 Lexington Ave., New York 17  
Telephone Lexington 2-4735

LOS ANGELES OFFICE

Duane Wanamaker  
610 S. Broadway, Los Angeles 15  
Telephone Mutual 2161

H. T. McDERMOTT, *President*  
H. T. CURTIS, *Vice President*  
L. R. TOWNSLEY, *Sec.-Treas.*

H. T. McDERMOTT  
*Editor and Publisher*

H. D. BUSBY, *Managing Editor*

*Associate Editors*  
EMERSON A. BRANDT  
E. R. CURRY

L. R. TOWNSLEY, *General Mgr.*  
HELEN G. SMITH, *Asst. Mgr.*  
A. M. WILLCOX, *Eastern Mgr.*

*Advertising*  
R. L. HENDRICKSON, *Manager*  
GEORGE L. HEMLER  
EDW. DAVIESON  
N. G. HOCK

Official Organ  
REFRIGERATION SERVICE  
ENGINEERS SOCIETY

Subscription Rates United States  
\$3.00 per year. Single copies 35c.  
All other countries \$4.00 per year

Copyright, 1946  
by Nickerson & Collins Co., Chicago, 44

Vol. 16 SEPTEMBER, 1948 No. 9

## Contents

In this Issue.....	29
Complete Motor Protection with Dual Element	
Fuses—by John C. Lebens.....	31
Selection of Oil for Refrigeration and Air	
Conditioning Equipment—by Dr. Edgar R. Ross.....	36
Detroit Revises Code.....	42
Can You Tie This?.....	42
Build Confidence—Improve Business with Better	
Serviceman-Customer Relations.....	43
A New Merchandising Idea.....	45
Storage of Bone Tissue.....	46
Dismantling the Mills Direct Drive Unit.....	47
Servicing the Universal Cooler Hermetic Unit.....	51
Selection of Gaskets and Their Installation.....	59
Service Pointers:	
Handling Tape.....	60
Boiling Oil Out of Evaporators.....	60
Measuring Torque.....	60
Special Elbow Fittings.....	60
Wrench Adapter.....	67
Why Do Coil Ratings Vary?.....	61
Questions and Answers:	
Mills Ice Cream Maker.....	62
Fountain Frosts Back.....	62
Result of Mixing Refrigerants.....	66
The Modern Food Market.....	68
Air Conditioning Defined.....	70
Low Temperature Equipment for the medical	
profession.....	70
RSES News and Activities:	
New Recorded Program.....	72
Sciota Auxiliary Formed.....	72
Yosemite Chapter Receives Charter.....	72
Boston Expects 3,000 to see 80 Exhibits.....	76
Thomas Heads CARSES.....	80
Chicago Prepares for 11th Annual Convention.....	80
Springfield Awaits Your Arrival.....	82
Nearly 10,000 Members in RSES.....	82
Revision in Constitution and By-Laws.....	86
RSES Material Display.....	86
Paul Reed Appointed Full Time Educational Director.....	88
Safety Department.....	90
J. J. Croushore Returns to Columbus.....	90
Taft Service Manager at Universal.....	92
Chapter Notes.....	92
News of the Equipment Industry.....	98
New and Improved Equipment.....	106
Trade Literature.....	114
Personnel Notes.....	116

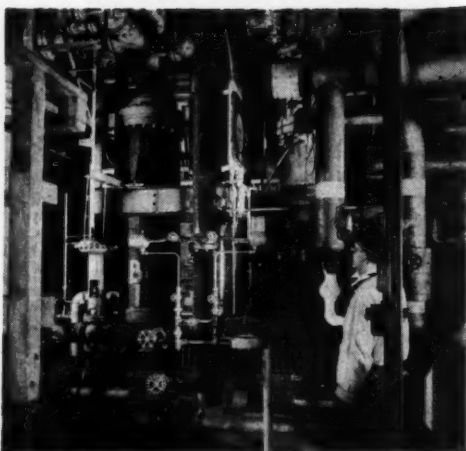
# NOW—PLENTY OF "FREON"

THE new Kinetic plant at East Chicago, Indiana, increases production of "Freon" safe refrigerants and propellents by approximately sixty per cent. As a result, there is now plenty of "Freon" for every purpose. No longer is there a reason for individual stock piling.

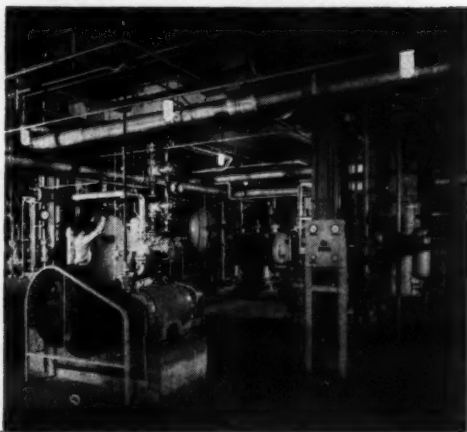
Need for greater production stemmed from the steadily growing demand for these superior refrigerants. Today, they are used by all the prominent manufacturers of air conditioning and refrigerating equipment. These manufacturers realize that uniform purity and quality of "Freon" are factors in prolonging the life and service of their equipment.

"Freon" refrigerants are dry . . . almost totally anhydrous. There are less than ten parts of moisture in a million parts of "Freon" . . . less than half a gram of moisture in a 145-lb. cylinder! This dryness eliminates risk of freezing tiny capillary tubes in refrigerating units. It insures the proper operation of the compact, space-saving equipment made possible and practical through the use of these refrigerants.

"Freon" refrigerants are also non-toxic, nonflammable, nonexplosive . . . and are ideal for every type of household, commercial or industrial application. When the occasion arises . . . protect your investment by being sure that the air conditioning or refrigerating equipment you install is designed to utilize "Freon" safe refrigerants. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.



● Maze of pipes, valves, gauges typifies equipment required in the intricate manufacture of "Freon."



● General view of one of the floors in the new Kinetic Chemicals plant at East Chicago, Indiana.

# » IN THIS



# ISSUE »

**C**OMplete motor protection through the use of a fuse in the line has never been quite possible with any of the fuses available on the market because if a large enough fuse to hold the circuit during the starting periods was used, the motor could burn out due to extended periods of overloads or overheating. A fuse of a lower rating would not hold the line during starting periods under load. This problem seems to be pretty well solved, however, with a new dual element fuse made by Bussman. The story of how it works appears on page 31.

**D**R. Edgar R. Ross completes the article in this issue on "Selection of Oil for Refrigeration and Air Conditioning Equipment." As a wind-up to the rather lengthy but very interesting discussion he provides some very useful tables showing the grades of oil to be used in the compressors of most makes of domestic and commercial machines. These tables should prove valuable to the man in the field.

**A**NY one who must deal with the public as much as a refrigeration service engineer should pay considerable attention to customer relations and certainly the building of customer confidence and better business will depend greatly on the relations existing between the customer and serviceman. We think the suggestions made in the article appearing on page 43 are the best we have seen in recent years and worth your reading time.

**A**SHOW case on wheels is the new merchandising tool of a West Coast wholesaler which is meeting with considerable success. The story appears on page 45.

**T**HE instructions contained in the article "Dismantling the Mills Direct Drive Unit" may save you considerable time on your first contact with this unit. Read about it on page 47.

**O**N page 51 is another addition to your set of service instructions on hermetically sealed units. This time it covers the field service of Universal Cooler units which will be found on many brand name domestic refrigerators, water coolers, farm milk coolers, farm and home freezers and other packaged equipment. Because wholesalers across the country are being appointed franchised dealers for these units and parts, the service field will find increasing use for them.

**H**AVE you wondered why there is such a variation in coil ratings? An item under Service Pointers on page 61 explains these variations and helps in the calculation of coil surfaces.

**T**HE modern supermarket of today is one of the largest users of refrigeration equipment and of electrical equipment in the retail group. See page 68 for a look at the imposing list to be found in these establishments.

## Cover

**O**UR front cover this month shows two of the spots of interest to the visitor in Boston, Mass., where the first Eastern Refrigeration and Air Conditioning Educational Exhibit and Conference will be held October 8, 9 and 10. The upper photo is of Faneuil Hall, one of the historic landmarks of the city, and the lower photo shows the beautiful State Capitol building.

# Muscle for a million jobs •



Boost your sales  
with  
**JACK & HEINTZ**  
Better electric motors

BACKED BY COAST-TO-COAST SERVICE



Electric Motors



Ball Bearings



Refrigeration Compressors



Elsmann Magnets

*These two* popular types of J & H Motors are now on the job in America's shops, farms and homes . . . quietly and dependably powering more than a million machines and appliances. The Type C1 Split-Phase Motor (left) powers easy-to-start applications such as blowers, fans, centrifugal pumps. The Type C2 Capacitor-Start Motor (right) drives refrigeration compressors, reciprocating pumps and other hard-to-start applications. Each is the result of J & H superb engineering skill and precision-production "know-how." Write for full information on the J & H Motor Franchise for your area.



Aircraft Starters



Aircraft Generators



Aircraft Inverters

**JACK & HEINTZ JH PRECISION INDUSTRIES, INC., Cleveland 1, Ohio**

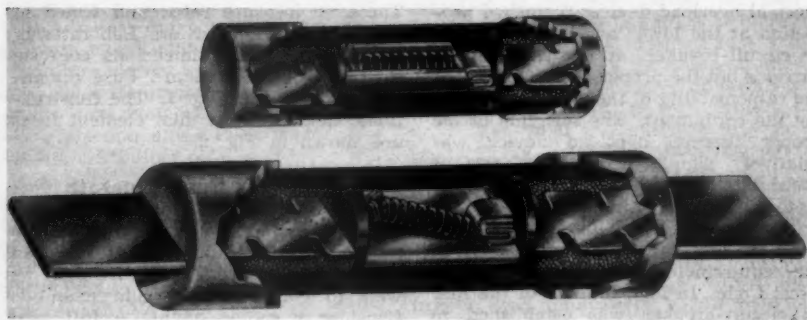


Fig. 2.—Fuse Combining Thermal Element With Fast Acting Fuse Link, Known as Fusetron.

## Complete Motor Protection With Dual Element Fuses

By JOHN C. LEBENS\*

DUAL element or thermal time-lag fuses were developed and made available some years ago to meet the acute need for complete protection of motors, solenoids, and similar electrical apparatus. All such electrical devices are capable of withstanding low overloads for appreciable periods without injury because of their inherent thermal capacity. A small overload generates a little additional heat which is absorbed by the apparatus raising its temperature slowly until finally a dangerous temperature is reached. This temperature usually is the temperature at which the insulation is destroyed.

As the size of the overload is increased the rate at which the temperature increases becomes more rapid until finally, at very high overloads where there is little time for thermal conduction, the temperature of the copper wire in the windings increases so rapidly that it burns out before any of the heat can be absorbed by the machine. Hence the safe time-current characteristic of all electrical apparatus is inversely proportional to the heat generated by the current flowing through it and is directly proportional to the thermal capacity of

unit. Since the heat generated is proportional to the square of the current the safe time-current characteristic is of the general shape of a square law curve modified by the thermal capacity.

To completely protect such equipment the device must have exactly the same shape time-current characteristic. Then, if its size is chosen correctly, the protective device will hold the overloads without blowing until that instant before the motor or solenoid reaches the dangerous or damaging temperature. If the load is decreased at that instant before the motor is not injured and the protective device has not functioned to remove the motor from the line. However, the motor now is heated up so that if the load is applied again it will be capable of withstanding this load for a shorter time and the protective device also must have its opening time reduced to be ready to blow at the instant before the damaging temperature is reached.

### Dual Element Fuse

Until the advent of the dual element or thermal time-lag fuse there was no single device available which could be matched to the motor safe time-current characteristic over its entire range. The

\*Chief Engineer, Bussman Mfg. Co.

thermal overload devices furnished protection at the lower overloads, the fuse or circuit-breaker, at the short-circuit currents but the proper combination was the responsibility of the engineer installing the equipment. The selection of the proper thermal overload device was relatively simple because its size is based on the name plate rating of the motor. However, the selection of the proper fuse or circuit-breaker size was more or less rule of thumb based on the requirements of the National Electrical Code. In fact, the size of the fuse or circuit-breaker was established to protect the thermal overload device and prevent it from blowing up on short-circuit rather than trying to obtain complete protection for the motor.

The development of the dual element fuse completely eliminated this guess work from the selection of the electrical protection for motors. This device provides a packaged unit, factory calibrated, combining a fuse and thermal cutout so that the fuse takes over at those loads where the safe time of the motor is so short that the thermal overload device is too slow acting to give the desired protection.

Dual element fuses are available 1/10 to 600 ampere, 250 and 600 volt ratings in the cartridge sizes; 3/10 to 30 ampere, 125 volt ratings in the edison base plug sizes; and 3/10 to 30 ampere, 125 volt ratings in the special tamper-resisting plug base which prevents over-fusing.

These devices are rated and tested as fuses by the Underwriters' Laboratories, Inc. so that their dimensions conform to the N. E. C. standard Fuse dimensions as shown in Fig. 1. The constructional details of the dual element fuses are shown in Fig. 2.

### How Dual Fuses Operate

To understand more thoroughly the reason why the dual element fuse can protect a motor completely it might be well to consider a specific example. Consider a motor having a full load running current of 15 amperes and assume the starting current is approximately 90 amperes. At the instant the switch is closed the current flowing through the motor jumps to 90 amperes and, if the motor is fully loaded, the current drops rapidly to 15 amperes where it remains constant. The protective device must carry this surge of 90 amperes long enough to permit the motor to come up to speed.

If an ordinary 15 ampere fuse were used to protect this motor the fuse would blow at 90 amperes in 1/10 seconds, so that each time the switch were closed the fuse would blow preventing the motor from starting. Before the dual element fuse was developed the only alternative was to overfuse, using a 45 ampere fuse to carry the starting current. However, a 45 ampere fuse is three times the full load rating of the motor

Fig. 1 — N.E.C. Standard Fuse Dimensions

250 VOLT						
Rating in Amperes	Length over all	Dia. of Tube	Dia. over Ferrules	Contact Blade		
				Thickness	Width	Length
1 to 30	2"	1 $\frac{1}{2}$ "	9 $\frac{1}{16}$ "			
35 to 60	3"	3 $\frac{1}{4}$ "	13 $\frac{1}{16}$ "			
70 to 100	5 $\frac{7}{8}$ "	1"		1 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	1"
110 to 200	7 $\frac{1}{8}$ "	1 $\frac{1}{2}$ "		3 $\frac{1}{16}$ "	1 $\frac{1}{8}$ "	1 $\frac{3}{8}$ "
225 to 400	8 $\frac{5}{8}$ "	2"		1 $\frac{1}{4}$ "	1 $\frac{5}{8}$ "	1 $\frac{1}{2}$ "
450 to 600	10 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "		1 $\frac{1}{4}$ "	2"	2 $\frac{1}{4}$ "
600 VOLT						
1 to 30	5"	3 $\frac{3}{4}$ "	13 $\frac{1}{16}$ "			
35 to 60	5 $\frac{1}{2}$ "	1"	1 $\frac{1}{16}$ "			
70 to 100	7 $\frac{1}{8}$ "	1 $\frac{1}{4}$ "		1 $\frac{1}{8}$ "	3 $\frac{3}{4}$ "	1"
110 to 200	9 $\frac{5}{8}$ "	1 $\frac{3}{4}$ "		3 $\frac{1}{16}$ "	1 $\frac{1}{8}$ "	1 $\frac{3}{8}$ "
225 to 400	11 $\frac{5}{8}$ "	2 $\frac{1}{2}$ "		1 $\frac{1}{4}$ "	1 $\frac{5}{8}$ "	1 $\frac{1}{2}$ "
450 to 600	13 $\frac{3}{8}$ "	3"		1 $\frac{1}{4}$ "	2"	2 $\frac{1}{4}$ "



so that any trouble such as lack of oil, worn bearings, tight belt, overloading, low voltage, or single phasing which increased the current to 45 amperes or less could cause the motor to burn up without the fuse blowing. Hence the only type protection afforded by such fuses was short-circuited protection.

Now a 15 ampere dual element fuse can be used to protect the motor. The 15 ampere dual element fuse with its thermal time delay will hold the starting current of 90 amperes for 6.9 seconds, ample to permit the motor to come up to speed. However, this fuse is designed to open at 125 per cent load within one hour (The N. E. C. standard only requires 135 per cent load but we impose the additional requirement on the fuse to simplify the selection of the proper size and assure complete protection). Therefore, if the motor is overloaded even slightly so that its current increases to 18.75 amperes the dual element fuse will open to protect it before the motor can be injured.

As the overload is increased the opening time of the dual element fuse decreases in exactly the same manner as the safe time of the motor decreases. At 45 amperes or 200 per cent overload the opening time has dropped to 35 seconds so that complete protection is assured over the entire operating range of the motor.

### Thermal Protection

Dual element fuses not only protect the motor from electrical overloads but, when installed in the same ambient, protect against thermal overloads as well. As already mentioned, failure of the motor at low overloads occurs because the temperature of the entire unit is elevated until a temperature is reached at which the least thermally resistant component is damaged. This usually is the insulation on the wire of the winding. Increasing the ambient temperature in which the motor is operating decreases the amount of heat that can be generated in the motor before this temperature is reached. Hence the capacity of the motor is decreased with increased ambient.

The operating temperature of the thermal element of the dual element fuse is 280 F. so that its time of open-

ing also is decreased with increased ambient. Therefore, the effect of higher ambients on the dual element fuse and the motor is exactly the same so that a motor protected properly at ordinary temperatures is equally well protected no matter what the ambient may be. In fact, the increased motor capacity in extremely low temperature applications also is made available with dual element fuses because again the thermal characteristics of the protective device and the equipment go hand in hand.

This feature was proved so effectively in war time applications where an aircraft motor called upon to operate on the ground in Africa as well as 20,000 feet in the air was completely protected and full capacity was obtained without needless blows. This simplifies the selection of the proper size dual element fuse for motor protection because, if its performance is checked at one ambient, the engineer is assured of equally satisfactory performance at higher and lower temperatures. The only requirement is that the dual element fuse and the motor be subjected to the same ambient.

### Less Fuse Heating

One not familiar with the dual element fuse will instantly call to mind those fuse panels running so hot at full load that the cabinet door cannot be touched comfortably and wonder just what this will do to the ambient and the performance of the dual element fuse. Actually this is not a problem with the thermal time delay fuses because cabinet heating is an impossibility with their use. Fuse cabinet heating is caused by one of two causes and, with ordinary fuses it is hard to tell which is the cause and which the effect.

Fuses, like all protective devices, operate from the heat created by the current flowing through them. But ordinary fuses use zinc or zinc alloys as the fusing metal and the melting point of zinc is 786 F. Hence ordinary fuses must reach a temperature of 786 F. to blow instead of 280 F., the operating temperature of the dual element fuse's thermal cutout. Because of this the resistance of the dual element fuse can be made appreciably less than that of an ordinary fuse so that the heat generated by the protective device is reduced ma-

terially. As an example, the resistance of the 600 ampere 250 volt dual element fuse is only .000073 ohms. The resistance of the best ordinary fuse is 117 per cent greater than this value. In fact, this value is so low that it is overshadowed completely by the contact resistance between the dual element fuse and the fuse clips.

### Clips Are Protected

The resistance of the fuse clips brings up another important consideration. Fuses overheat not only because of the heat generated by the fuse itself but, more often, because of the high contact resistance between the fuse and the clip or between the clip terminal and the wire connected to it. Seldom, if ever, are fuses removed from panelboards, the clips inspected, cleaned, and tightened until trouble develops after years of trouble-free performance. With the ordinary fuse this is too late. Once the clip starts heating the temperature continues to rise until the melting temperature of the fuse link (786 F.) is reached at which time the fuse burns up, the temper of the clip has been destroyed, and the insulation charred from the leads connected to the clips.

If this trouble could have been detected at the instant it became acute, before the heat generated had an opportunity to produce additional oxidation aggravating the condition, the panelboard could have been saved and the loose connection or dirty clip causing the trouble corrected. With dual element fuses this is possible. As soon as the temperature increases to 280 F. the thermal operates opening the circuit, forcing the proper maintenance of the fuse panel before it is too late. Hence the dual element fuse not only protects the associated electrical equipment but it protects itself as well. With the device damaging temperatures are impossible and cool panelboard operation is assured.

Another extremely desirable characteristic of the dual element fuse is its vibration strength. As shown in Fig. 2, the short-circuiting chambers are separated from the thermal overload chamber by means of fibre washers supported by the tube. Even though the primary purpose of the washers is to prevent the arc-quenching filler, used in the

short-circuiting chambers, from sifting into the center chamber they have the added advantage of producing an extremely rigid construction. Hence the fuse element, from a vibration standpoint, is only one third as long as the element of an ordinary fuse so that the resonant frequency of the element is extremely high, well above any fundamental or harmonic vibration encountered in normal installations. Therefore, the danger of the link resonating and tearing itself apart is eliminated.

### Increased Strength

The support afforded by the fibre washers in the dual element fuse not only eliminates the danger of pure vibration failures but it also greatly increases the strength of the fuse from a mechanical shock consideration. Sudden blows, such as experienced when electrical equipment is mounted on the frame of punch presses actually may jar the equipment so severely that mechanical failure results. However, the rugged construction of the dual element fuse precludes this type failure.

Since it is desirable to mount the dual element fuse in the same ambient as the motor being protected, this enhanced vibration and impact strength makes it possible to mount the devices on the machine itself even though considerable vibration may be present. They need not be considered in the same category as relays and thermal overload devices where impact may cause contact chattering or breakage of the linkages.

A cursory examination of the dual element fuse would create the impression that interrupting capacity is sacrificed because the fuse section is only two-thirds that of an ordinary fuse and the fuse links in the dual element fuse have a larger rating than those in an ordinary fuse of the same capacity. Actually the reverse is the case. Even though the fuse element of a 60 ampere dual element fuse does not operate until 300 amperes flows through the device whereas the fuse element of an ordinary fuse operates at 81 amperes, the interrupting capacity of the dual element fuse is many times that of the ordinary fuse.

The reason for this seeming inconsistency is found in the basic design limi-

tations of the two fuses. The fuse link of an ordinary fuse must be designed to give satisfactory performance over the entire range of currents from zero amperes up to and including short-circuits of infinite capacity. Obviously, compromises must be made and excellent performance at one point sacrificed so that the performance over the entire range is satisfactory. The design problem in the dual element is entirely different. The fact that the thermal overload device handles loads up to and including 500 per cent load permits the design of the fuse link to give optimum results under high overload and short-circuit conditions. Hence, the design of the fuse links and the material selected for them are influenced by the single consideration of short-circuit performance.

Copper and copper alloys are used for the fuse links in the dual element fuse instead of zinc as used in ordinary fuses. The higher melting point and lower resistance of the copper make it possible to reduce the amount of metal used in the links. On short-circuit this metal is volatilized and absorbed by the arc-quenching filler thereby materially increasing the speed of interruption. In fact, the speed is so great that the current actually flowing seldom has an opportunity to build up to the amperes available so that the equipment protected by the dual element fuses are not subjected to the extremely high magnetic forces incident to such currents.

### Tests

Tests were conducted on the dual element fuses manufactured by the Bussmann Mfg. Co. on a circuit set to deliver 50,000 root mean square (average) amperes (peak current of 70,500 amperes). The peak currents actually flowing and the clearing time in seconds are shown in Fig. 3. These figures emphasize the speed with which the dual element fuse operates under short circuit conditions and show the current limiting action of the fuse.

Even though the circuit was set to deliver 70,500 peak amperes only 7,000 amperes actually flowed before the 30 ampere unit cleared the circuit. The total clearing time from the instant the

current was zero until it again returned to zero was .001 seconds. These figures show that the larger the rating of the dual element fuse the greater the current flowing but that once the circuit capacity exceeds the peak current permitted by the fuse, further increase in circuit capacity does not influence its performance.

**Fig. 3 — Peak current and clearing time of dual element fuse on circuit set to deliver 70,500 amperes.**

Rating of Dual Element Fuse (Amps.)	Peak Current (Amps.)	Clearing Time (Seconds)
30	7,000	.001
60	17,000	.001
100	26,000	.001
200	45,000	.004
400	69,000	.004
600	89,000*	.007

\* 89,000 amperes recorded for 600 ampere size caused by a symmetrical sine wave produced by point of closure on voltage wave.

To prove this important point tests were conducted on 100 ampere 250 volt dual element fuses on a circuit set to deliver up to 140,000 amperes peak current. The dual element fuse cleared this extremely high short-circuit current perfectly and the oscillograms showed that only 26,000 amperes flowed for .001 seconds. Hence dual element fuses can be used with safety and assurance on any circuit no matter what its capacity to completely protect motors. The only facts needed for the selection of the proper size is the ampere and voltage rating of the motor and the type service.

★ ★ ★

### N.E.R.A. Launches Campaign

THE National Electrical Retailers Assn. is inviting the country's estimated 70,000-80,000 appliance dealers to join forces with them in NERA's Fifteen Point program for the industry, a program which covers such a variety of fields as franchise improvements, sales promotion, installation problems, service responsibilities, trade-ins, tie-in sales, the gray market, builder and multiple purchase sales, discounts, back-door selling, legislation and co-op taxation, fair trade prices, advertising and rural market promotion. Meetings will be arranged in every prominent city.

# Selection of Oil for Refrigeration And Air Conditioning Equipment

By DR. EDGAR R. ROSS\*

## Effect of Refrigerants on Lubricating Oils

**F**REQUENTLY, lubrication engineers and salesmen are confronted with operating problems that manufacturers and operators of refrigerating equipment attribute, without good reason, to the lubricating oil. From long experience it has been determined that most of these problems are caused not by the oil, but by: (1) improper mechanical adjustments for given operating conditions, (2) the presence of too much water in the refrigerant system, and (3) the effect of certain refrigerants on the lubricating oil.

Extensive research carried out for many years in Sun laboratories has proved the importance of such oil-refrigerant relationships as miscibility, solubility in both liquid and vapor phases, emulsibility, and the effects of pressure and temperature.

The refrigerants in everyday use have varying effects on refrigerant compressor oils.

## Absorption of Ammonia in Oil (Volume of gas absorbed by unit volume of oil)

Pressure lb./sq. in.	Temperature		
	32 F	72 F	150 F
14.7	3.14	2.20	1.24
29.3	6.34	4.44	2.39
44.0	10.05	6.60	3.56
58.7	15.66	8.53	4.69
146.7	.....	.....	12.43

Source: Refrigerating Data Handbook, Vol. 1.—  
American Society of Refrigerating Engineers.

## Ammonia (NH<sub>3</sub>)

Anhydrous ammonia has little effect on a well-refined lubricating oil. Because of its low solubility in oil, ammonia does not lower the viscosity of the

oil. In the presence of moisture, however, ammonia will emulsify with oil. For this reason the compressor oil should be dehydrated to make sure that it is "dry," and care must be taken that water be kept out of the system to prevent freezing in the expansion coils, with consequent shut-downs, and the formation of oil emulsions which might cause considerable difficulty.

## Concluding Article

The first part of this article, contained in the August issue, dealt primarily with the characteristics of good oil. In this, the concluding article, the author describes the effects of various refrigerants on oil, then gets down to specifying the grade of oil to be used on each make of refrigerating machine.

## Carbon Dioxide (CO<sub>2</sub>)

Carbon dioxide has no effect on oil, which is not soluble in this refrigerant. Good lubricating oils have a sufficiently high flashpoint to prevent the formation of vapors which might be carried along with the refrigerant.

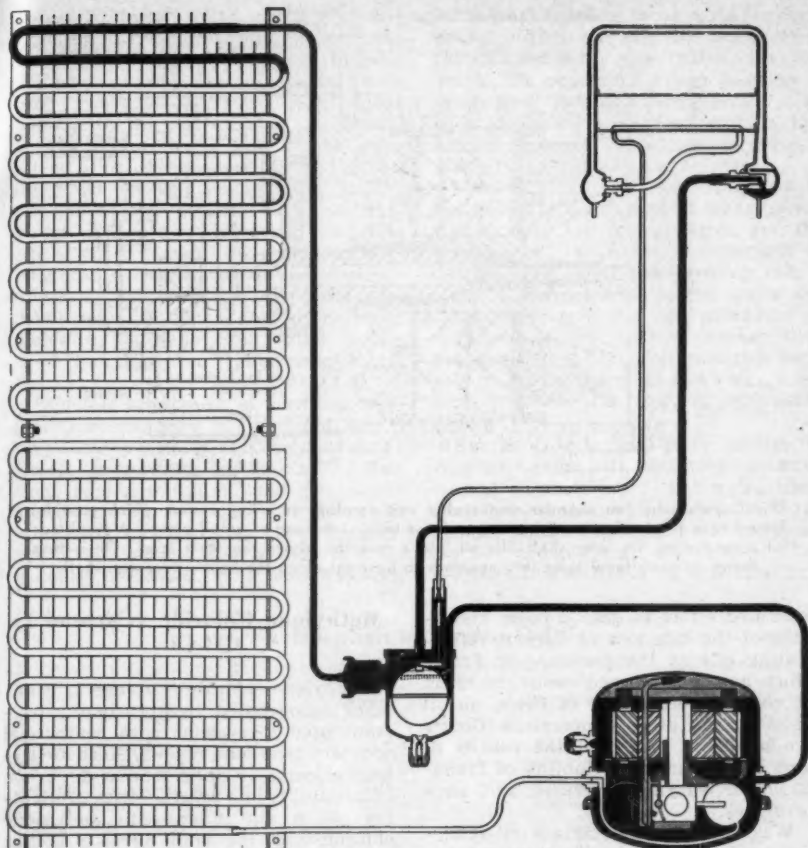
## Sulphur Dioxide (SO<sub>2</sub>)

Sulphur dioxide must be perfectly dry before it is introduced into the system, because this refrigerant is very soluble in water. Dissolved in water, it forms a strongly acidic and highly corrosive solution. The lubricating oil likewise must be practically free from moisture for the same reason.

At ordinary temperatures, sulphur dioxide is not fully miscible with pure lubricating oil, and will not reduce its

\* Chemical Engineer, Industrial Products Department, Sun Oil Company, Philadelphia, Pa.





The Crosley "T 5" hermetic unit is arranged with the compressor above the motor and entirely above the oil level. This is a reversal of the usual arrangement of hermetic units. Oil is pumped by a small piston pump through a tube from the bottom of the dome to all working parts of the compressor.

viscosity. But it is a selective solvent that may cause the extraction of yellow, gummy sludges from inferior oils. Because such sludges usually settle out around nozzles and valves, it is important to prevent their formation by using carefully refined and filtered oils from which these contaminants have been removed.

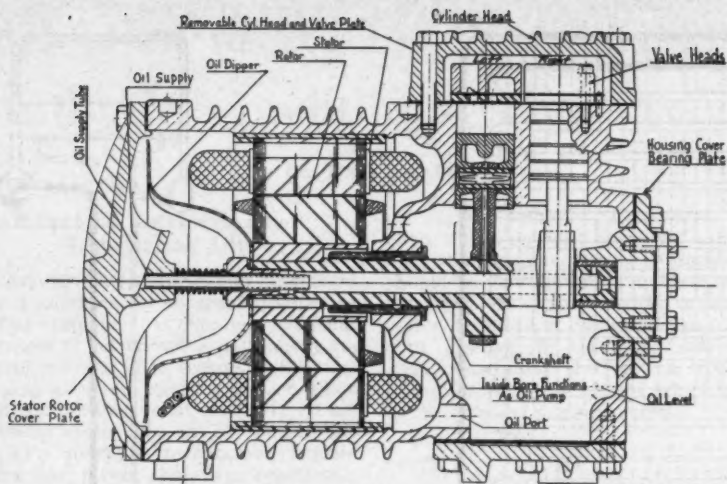
The newer types of halogenated refrigerants do not react chemically with high grade, well-refined refrigerating oils. Since these refrigerants are completely miscible with oil, some refrigerant circulates with the oil to the bear-

ing surfaces, and some oil passes through the system with the refrigerant.

### Freon Group

Refrigerants in the Freon group are completely miscible with mineral oils over a wide range of temperature. This complete miscibility causes a reduction in viscosity that must be compensated for by using heavier oils.

Since a major percentage of commercial and domestic refrigerators using Freon are lubricated with Suniso oils, Sun engineers have made a con-



This Copelametic two cylinder semi-sealed unit employs an oiling system which provides forced feed lubrication to all bearing surfaces without the use of an oil pump. A two-blade oil propeller on the rotor shaft lifts oil into a reservoir above the shaft level. Oil is then drawn by centrifugal force into openings to bearings along the hollow eccentric shaft.

centrated effort to gain a basic knowledge of the behavior of various refrigerating oils in the presence of Freon. Much has been learned about the effect of varying percentages of Freon on oil viscosity at a given temperature. Charts are available based on the results of tests to measure the solubility of Freon-12 under varying pressures and temperatures.

Wax drops out of certain oil-refrigerant mixtures at specific temperatures, and Freons have a reaction on mineral oils that sometimes causes wax separation at low temperatures. The standard test for determining wax content of a refrigerator oil is the methylethylketone test, which is run at 10 F and -35 F.

The effect of the Freons on the viscosity of oils is of fundamental interest to refrigerating engineers. Because there is no way of keeping the refrigerant from carrying oil through the system, it is important to choose an oil that will not deposit wax and sludge on vital parts such as expansion valves, capillary tubes, and condenser walls. Moreover, the lubricant must provide effective lubrication even when it is diluted with refrigerant.

## Methylene Chloride (Carrene 1) $\text{CH}_2\text{Cl}_2$

Methylene chloride (Carrene 1) is another halogenated hydrocarbon refrigerant used in systems with centrifugal or rotary type compressors. Since methylene chloride is quite similar to Freon in miscibility and reaction with lubricating oil, a unit filled with methylene chloride uses the same oil as a similar unit filled with Freon.

## Methyl Chloride ( $\text{CH}_3\text{Cl}$ )

At the temperatures and pressures found in refrigerating systems, methyl chloride gas dissolves in somewhat limited quantities; it does not react chemically with well-refined lubricating oils.

## Low-Temperature Installations

Modern developments in the construction of refrigeration equipment, and the application of low-temperature refrigeration commercially and in the home, have created a need for improved compressor lubricants. Temperatures well below zero (-120 F or even lower in special applications) are now main-



tained in many units varying in size from small freezers to the largest commercial installations. Much of this development in the field of low-temperature refrigeration has been made possible by the perfection of new refrigerants. Moreover, the hermetically sealed unit, which is designed to run for years without changing or adding oil, has become popular with manufacturers of small refrigerating machines. All of these factors, the swing to low-temperature refrigeration, the introduction of new refrigerants, and the development of dependable hermetically sealed units, have contributed to the need for improved compressor lubricants.

Effective lubrication at very low temperatures requires an oil from which very little or no wax will drop out at the lowest temperature in the system. Wax clogs capillary tubing, and fouls condenser and cooler walls. If it drops out in or near an expansion valve, the output of the refrigeration system may be seriously decreased. This point has been

form what appears to be a single compound. When the mixture is expanded through an expansion valve, for example, the expanding Freon takes up so much heat that the oil-refrigerant mixture is cooled to a temperature low enough to cause the immediate precipitation of any wax in the solution.

Two factors, then, work together to hasten the precipitation of wax: operation at very low temperatures, and the tendency of the newer refrigerants to extract wax from refrigerating oils.

Since hermetically sealed units are designed to run with the minimum of maintenance, no matter whether they are operated at low or at moderate temperatures, the oil that lubricates them must be of the highest obtainable quality.

Suniso G oils are quite similar to regular Suniso oils, but they do have special characteristics that make them ideal low-temperature lubricants. Three grades, Suniso 3G, Suniso 4G, and Suniso 5G, are presently available. They conform to the following specifications:

### Specification of Suniso G Oils

	Suniso 3G	Suniso 4G	Suniso 5G
1. Viscosity, S.S.U. at 100 F.....	150-160	280-300	500-560
2. Gravity, API at 60 F.....	21.5-23.5	20.4-22.4	20.0-22.0
3. Flash Point, ASTM open cup.....	330-340F	350-360F	375F min.
4. Fire Point.....	370-390F	400-420F	435F min.
5. Pour rest, ASTM (max.).....	-35F	-25F	-10F
6. Color, ASTM.....	1 max.	1-2	2 max.
7. Neutralization No.....	Neutral	Neutral	Neutral
8. Steam Emulsion No. (max.).....	50	70	100
9. Dielectric Strength (min.).....	25 kv	25 kv	25 kv
10. Slight Oxidation.....	10-20	10-20	5-15
11. Flocc test for wax (max.).....	-70F	-50F	-40F

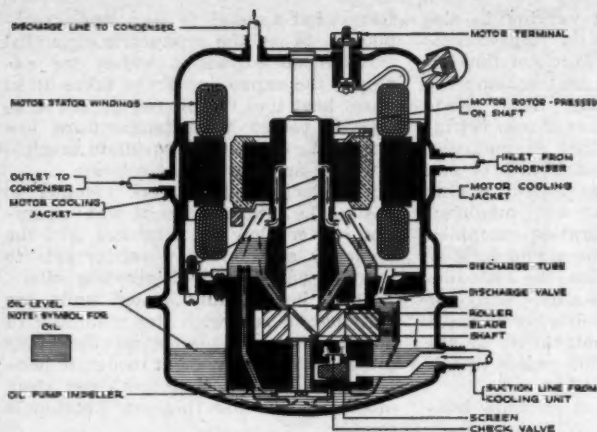
made clear in previous pages. It is restated here because it is nowadays even more important to have almost completely wax free oils for many installations.

The new refrigerants, the Freons in particular, have solvent-extraction properties that make them ideal solvents for the removal of wax from oils that contain more than traces of wax. The Freons and compressor oils are mutually soluble. This means that if Freon and oil are mixed in the same chamber, the two constituents mix immediately to

Examination of the values stated in the above table for viscosity, gravity, flash, fire and pour point indicates that these grades are all naphthene base oils from low paraffin content naphthenic crudes.

This is important, since it has been shown in previous pages that the best refrigeration oils are made from selected fractions from naphthenic crudes, as in the case of regular Suniso grades.

The color, neutralization number and steam emulsion number indicate the nature and degree of treatment, and are



In this Norga Rollator sealed unit, oil is picked up from the bottom of the dome by a small impeller pump and forced upward around the motor shaft and into a reservoir above the compressor. It flows by gravity over the compressor parts, picking up heat of friction and lubricating the parts.

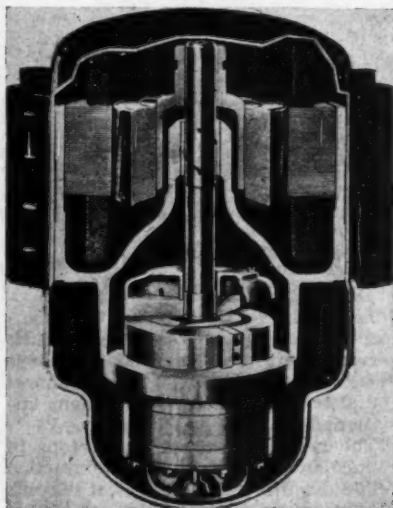
of relatively minor importance to the user of a refrigerant compressor oil.

The dielectric strength (see ASTM D877-46T) has been somewhat misapplied for determining the presence of excessive and objectionable moisture. A value of 25 kilovolts for an unused sample is directly indicative of the absence of foreign matter and of moisture in objectionable form only. Quantitative determination of moisture can best be obtained by chemical methods.

With respect to Suniso G oils, the floc test is the most important. It is a measure of the tendency for wax to separate from a refrigerant-oil mixture at low temperatures. In this test a mixture of 10 percent oil and 90 percent Freon-12 is gradually cooled until a definite "floc" begins to drop out of the mixture. It will be seen that the floc-test figures are far below the temperature indicated by the pour points. This can be easily explained. It takes very little refrigerant to lower the viscosity of the oil enough to keep it in liquid form far below the temperature indicated by the pour test, which is run on the oil alone.

In actual service Suniso 3G, used in a system containing Freon 22, has provided satisfactory lubrication with no trouble from wax separation at temperatures as low as  $-120^{\circ}\text{F}$ . Suniso 4G has been used at  $-90^{\circ}\text{F}$  with perfectly satisfactory results. In low-temperature systems charged with Freon 22, a Suniso G grade must be used.

In the following tables showing the grades of Suniso recommended for use in prominent refrigeration and air conditioning units, Suniso 3G should be used in place of Suniso 3, and Suniso 4G in place of Suniso 4, whenever a unit is operated at temperatures colder than  $-30^{\circ}\text{F}$  and  $-20^{\circ}\text{F}$  respectively. When



In this Frigidaire "Meter Miser" unit the rotary compressor is partly submerged in oil. Oil is drawn into the compressor by suction and distributed to all parts of the compressor and to the motor shaft.

two or more grades are recommended for use in a specific make or type of compressor, use of the first listed grade will give satisfactory lubrication, no matter what the size of the unit. As a rule, smaller units use the lighter oils.

For breaking in a new or rebuilt compressor, it is preferable to use an oil two grades lighter than the oil recommended for normal operation, but an oil only one grade lighter may often be used. Thus, if No. 4 is recommended for the normal operation of a given compressor, No. 2 would be the first choice, and No. 3 the second, for breaking in. Obviously, since it is the lightest grade available, No. 1 is the only grade that can be used to break in compressors that normally use No. 2 or No. 1. It is light enough, however, to give adequate lubrication of such compressors during the break-in period.

### Lubrication Recommendations

The recommendations given in the following tables can be used for determining the proper grade of oil for any commercial, industrial, or domestic compressor. Recommendations for specific makes of (1) domestic refrigeration units and (2) air conditioning units are listed according to trade names.

### General Recommendations

Refrigerant	Type of Compressor	Suniso Recommended
Ammonia	Reciprocating	No. 3, 4 or 5**
CO <sub>2</sub>	Reciprocating	No. 3, 4 or 5*
SO <sub>2</sub>	Reciprocating	No. 1, 2 or 3
	Rotary	No. 3 or 4
MC	Reciprocating	No. 3 or 4
Methylene Chl. (Carrene No. 1)	Centrifugal	No. 3 or 4
	Rotary	No. 3 or 4
F-12	Centrifugal	No. 3 or 4
	Reciprocating	No. 3 or 4
F-114	Rotary	No. 3 or 4
F-11 (Carrene No. 2)	Centrifugal	No. 3 or 4
F-21	Reciprocating	No. 3 or 4
F-22	(All low-temp. installations)	3G or 4G
F-113	Centrifugal	No. 3 or 4

*Note*—Suniso 3G, 4G and 5G may be used in place of Suniso 3, 4, and 5, especially for low-temperature operations.

\* When oil may enter refrigeration system or compressor cylinders, use Suniso 3 or 4. When oil is prevented from entering systems and cylinders, use Suniso 5 in force-feed or gravity systems and Suniso 3 for splash systems. Use Pittsburgh Cylinder Oil for steam cylinder lubrication when condensate is reclaimed for ice-making.

\*\* In exceptional cases where abnormal operating conditions result in excessive discharge temperatures, etc., it is suggested that a Sun engineer be consulted for specific recommendations.

### Air Conditioning Units

Trade Name	Type of Compressor*	Refrigerant	Suniso Recommended
Airtemp	Rec.	F-12	No. 4 or 3
Baker	Rec.	F-12	No. 4 or 3
Brunner	Rec.	F-12 or MC	No. 4 or 3
		CO <sub>2</sub>	No. 4 or 3
Carbondale	Rec.	F-12 or MC	No. 4 or 3
Carrier	Rec. & Cent.	Various	No. 4 or 3
Cochran	Rot.	MC	No. 4 or 3
Crosley	Rec.	F-12	No. 4 or 3
Curtis	Rec.	F-12 or MC	No. 4 or 3
Fairbanks-Morse	Rec.	F-12	No. 4 or 3
Frick	Rec.	F-12	No. 4 or 3
Frigidaire	Rec.	F-12	No. 4 or 3
General Electric	Rec.	F-12	No. 4 or 3
Ilg	Rec.	F-12 or MC	No. 4 or 3
Kauffman	Rec.	F-12	No. 4 or 3
Kelvinator	Rec.	MC	No. 4 or 3
		F-12	No. 4
Lehigh Blue Cold	Rec.	MC or F-12	No. 4
Lipman	Rec.	F-12	No. 4 or 3
Lynch	Rec.	F-12 or MC	No. 4G
Norge	Rot.	F-12	No. 4 or 3
Servel	Rec.	F-12	No. 4 or 3
Standard	Rec.	F-12	No. 4 or 3
Strang	Rec.	F-12 or MC	No. 4 or 3
Universal Cooler	Rec.	F-12	No. 4 or 3
Vilter	Rec.	F-12	No. 4 or 3
Waukesha	Rec.	F-12	No. 4 or 3
Westinghouse	Rec.	F-12	No. 4
		Pressure lubricated	No. 5
		Splash lubricated	No. 4
Worthington	Rec.	F-12	No. 4
	Cent.	F-11 or F-12	No. 4
York	Rec.	F-12	No. 4 or 3
		Ammonia	No. 3, 4 or 5
	Cent.	F-12	No. 4 or 3
	Rot.	F-11	No. 4G

*Note*—Suniso 3G, 4G, and 5G may be used in place of Suniso 3, 4, and 5, especially for low-temperature operations.

\* Abbreviations: Rec. is Reciprocating; Rot. is Rotary; and Cent. is Centrifugal.

### Domestic Refrigeration Units

Trade Name	Type of Compressor*	Refrigerant	Suniso Recommended
Admiral	Rec.	F-12	No. 3 or 4
Atwater Kent	Rec.	MC	No. 4 or 3
Ben Hur (freezers)	Rec.	F-12	No. 4 or 3
Briggs	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Buckeye	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Challenger	Rec.	MC	No. 4 or 3
Chieftain	Rec.	F-12	No. 4 or 3
Coldspot	Rot.	F-12	No. 4 or 3
Continental	Rec.	F-12	No. 4G
Copeland	Rec.	F-12	No. 4 or 3
Crosley	Rec.	F-12	No. 3 or 4
Dayton	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Deepfreeze (freezers)	Rec.	F-12	No. 3G
Detroit	Rec.	F-12	No. 4 or 3
		MC	No. 4 or 3
Electro-Kold	Rec.	MC	No. 4 or 3
Fairbanks-Morse	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Federal	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Frigidaire	Rot.	F-12 or F-114	No. 4 or 3

## Domestic Refrigeration Units (Continued)

Trade Name	Type of Compressor*	Refrigerant	Suniso Recommended
Gaffers & Sattler	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
General Electric	Rec.	F-12	No. 4 or 3
		SO <sub>2</sub>	No. 1, 2 or 3
Gibson	Rec.	F-12	No. 3 or 4
Giffman	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Grunow	Rot.	Carr.	No. 3 or 4
Hostess	Rot.	SO <sub>2</sub>	No. 4 or 3
Hotpoint	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
		F-12	No. 4 or 3
IceMASTER	Rec.	MC	No. 4 or 3
Ice-O-Matic	Rec.	MC	No. 4 or 3
Jack & Heints	Rot.	F-12	No. 4G
Jewett	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Kelvinator	Rec.	F-12	No. 4 or 3
Leonard	Rec.	F-12	No. 4 or 3
Lynch	Rec.	F-12 or MC	No. 4G
M & E	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
		F-12	No. 4 or 3
Mayflower	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
National	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Norge	Rot.	F-12	No. 4 or 3

O'Keefe & Merritt	Rot.	SO <sub>2</sub>	No. 4 or 3
Parker Frostkist	Rec.	SO <sub>2</sub>	No. 4 or 3
Philco	Rec.	F-12	No. 4 or 3
Potter	Rec.	MC or F-12	No. 4 or 3
Sanitary	Rec.	MC or F-12	No. 4 or 3
Sparton	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Starr Freeze	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
	Rec.	MC	No. 4 or 3
Stewart-Warner	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
Tecumseh	Rec.	F-12	No. 4 or 3
		MC	No. 4 or 3
Trupar	Rec.	MC	No. 4 or 3
Truscon	Rec.	MC	No. 4 or 3
Universal Cooler	Rec.	F-12	No. 3G
Universal	Rot.	SO <sub>2</sub>	No. 4 or 3
Ward	Rec.	MC or F-12	No. 4 or 3
		SO <sub>2</sub>	No. 1, 2 or 3
Westinghouse	Rec.	SO <sub>2</sub>	No. 1, 2 or 3
		F-12	No. 4 or 3
Zerozone	Rec.	MC	No. 4 or 3
		SO <sub>2</sub>	No. 1, 2 or 3

*Note—Suniso 3G, 4G, and 5G may be used in place of Suniso 3, 4, and 5, especially for low temperature operations.*

*\* Abbreviations: Rec. is Reciprocating; Rot. is Rotary.*

## Detroit Revises Code

A RECIPROCAL licensing arrangement for refrigeration contractors between the city of Detroit and other municipalities in Michigan is provided for in the revised refrigeration code of Detroit which went into effect Thursday, August 26. In addition, there were several technical changes in the code.

Around Detroit, as with most major cities, there are numerous suburbs. With the increasing trend toward licensing, contractors have expressed the fear that they would have to pass examinations in all the cities, as well as pay various licensing fees in each.

The new section of the Detroit code would recognize contractors licensed by other communities in the state, provided the licensing requirements were "substantially equal" to Detroit's and the arrangement worked both ways.

Contractors licensed in other communities would then have to pay only a nominal registration fee in Detroit.

In the technical sections of the revised Detroit code, one completely new requirement was adopted:

"In institutional and public assembly occupancies the return line from air conditioning cooling coils located downstream from and in close proximity to a heating coil or located up-stream within 18 in. of a heating coil shall be fitted with a relief valve set not to exceed the maximum allowable test pres-

sure for the return line and discharging to the outside of the building."

This provision is included to prevent rupture of lines when an air conditioning system is shut down, say for the winter, and refrigerant might possibly get into the lines through leaking shut-off valves, explains the Detroit Bureau of Safety Engineering.

★ ★ ★

## Can You Tie This?

IT WAS during the flood season last spring down in Kingfisher, Oklahoma, that Lee M. Johnson, a former refrigeration serviceman now in the sign business, was called back to service to help get refrigerators back in operation when half the town was inundated in water. There were plenty of motors and relays to be torn down and dried out and plenty of units to be moved to higher locations, but the oddest sight of all, according to Mr. Johnson, was a Frigidaire unit installed under a porch. The water rose to a level above the unit and when Mr. Johnson arrived it had been under water for about two hours but the unit was running and streams of water were spurting out of the motor end bells.

Mr. Johnson says that people in his district should have top mounted condensing units and stabilizers to keep the refrigerators floating right side up.

# Build Confidence—Improve Business

with better

## Serviceman-Customer Relations



THE service business is again becoming a highly competitive business and as in sales of new equipment it is again necessary to brush up on sales technique and give with the best you have.

The serviceman has an advantage over the salesman in that he is called to the customer's premises instead of having to call on the customer. Thus the serviceman has an "inside track" to begin with and all he needs do is hold that position.

Holding the inside track is largely a problem of serviceman-customer relations and we think that these suggestions made by Philco Corp. to their dealers and servicemen just about cover the entire story.

### The Dealer's Serviceman

To aid in performing service work of any type in a most expeditious, profitable and efficient manner, and to assure the dealer and serviceman of having satisfied customers, there are several time-proven facts that should be kept to the forefront. A dealer or serviceman might advantageously compare his own methods with those herein itemized.

The customer must be kept satisfied by faultlessly performing equipment.

He should have at his call, prompt, courteous, efficient, and reasonably-priced service facilities.

A customer should never be told that the equipment he purchased is anything but the very best. Praising the equipment substantiates the customers feeling that he displayed good judgment when he made the purchase.

Complete familiarity with all functions and possible uses of the equipment are

essential, so that questions may be intelligently answered to the customer's entire satisfaction. Such knowledge is obviously invaluable to the serviceman, enabling him to quickly diagnose causes of malfunctioning.

A well equipped, efficiently managed service shop is a must for any successful business.

### Serviceman-Customer- Contact Hints

One of the most important functions of the serviceman is establishing customer confidence in the dealer and his service organization. He can rapidly gain (or lose) business standing for himself and the dealer; whether he gains or loses prestige is determined largely by the manner in which he approaches the problem. Several points worthy of consideration are noted.

A neat appearance, both in the person of the serviceman and the servicing equipment, gives the customer an immediate impression that the serviceman represents a high-quality dealer-service organization.

If a serviceman dresses like a laborer, he may well expect to be paid on that basis, whereas, if he dresses like a professional business man, his customers expect to pay service rates commensurate with his apparent ability.

The serviceman will find it profitable to be a good listener, but will never encourage long-winded, time consuming discussions on subjects irrelevant to his business.

His equipment should contain all the tools and test equipment necessary for competent, speedy service work.



When calling on a regular customer, the cause for complaint can usually be quickly isolated, since the customer's equipment and its previous service requirements are familiar to the serviceman. In the case of a new customer, pertinent question regarding previous servicing should be asked. Performance checks should be made to aid in diagnosing trouble.

Make a permanent written record of the transaction, to avoid future misunderstandings between the customer and the service organization.

Always try to have the customer in attendance while tests and examinations are being made. It is a poor policy to work on a unit in a home unless the customer, or one of his family, is present.

If unit removal and shop repairs are indicated, a cost estimate should be rendered, if at all feasible. Where this is immediately impossible, the unit may be removed to the service shop for further inspection, but in all cases an estimate should be given before actual repairs commence. It is advisable to require the customer to sign an order authorizing the work, thus avoiding possible embarrassment when the bill is tendered for payment. It has been proven that it is best to be a "one price man." A reasonable estimate should be made, and this figure should not be changed. Cut-price service work injures both customer and service organization.

### **Speedy but Courteous Service**

Courtesy is a must in customer contacts. The serviceman should have firm control of his temper, irrespective of the customer's attitude. A calm, courteous manner usually pacifies the most irate customer and helps in gaining his confidence and goodwill. Never engage in an argument. The serviceman's prime function, after all, is to render speedy, competent service. Do not hesitate to admit a mistake, since your customer will respect your truthfulness, and will call you again.

Learn the customer's correct name. Do this before making the call, if possible. The customer will immediately notice if he is addressed by name; this indicates to him that you were sufficiently interested in him to learn his name.

Be extremely careful to avoid dam-

aging any article in the customer's house.

It is best not to attempt to become too "chummy" with the customer.

An angry customer may often be calmed by referring to some object in the customer's home, of which he is obviously proud, praising the qualities of it and indicating that only one of excellent judgment and taste would own such an item.

All promises should be kept. Therefore make only reasonable ones, then spare no effort in living up to them. Broken promises quickly shatter confidence.

Upon receipt of a call from a customer, for service, prompt action should be taken. Do not force him to wait an extended length of time before taking action. To do so destroys customer confidence.

### **Obtaining Specific Performance Information From Customer**

The following service-record questions are suggested as a standard. The points listed are worthy of consideration, since they aid in quickly diagnosing service complaints. Do not hesitate to ask the customer pertinent questions covering his observations of the equipment. Encourage him to explain any actions observed, interposing leading questions to better obtain a rapid isolation of the source of trouble. Cover the following points:

- a. What is the nature of the trouble?
- b. How long has the trouble existed?
- c. Is the trouble intermittently present or is it of a steady nature?
- d. Does the customer fully understand unit operation and controls?
- e. Have major repairs ever been necessary? If so, what repairs were made?
- f. How long has the customer had the unit?
- g. Has it been inspected and serviced regularly?
- h. Is the unit used regularly, both summer and winter?
- i. If the unit has been stored, how long has it been out of use?

Preliminary questioning of the customer not only aids in diagnosing trouble but also indicates to him that you are thoroughly conversant with all phases of the problem in hand.



The customer usually desires an estimate on the cost of repairs and the probable date of completion of servicing. If extensive shop work is required, making it impossible to render an immediate estimate on the cost of restoring the equipment to first-class operating condition, the customer should be advised that he will be given the estimate after removal of the unit to the service shop and subsequent testing, but before the actual work is commenced. Upon determining the replacement parts requirements, their availability, and the amount of labor involved, the cost of the service and the date of return of the unit to the customer may be estimated. If extensive work is required, it should always be done in the shop, not only because of the accessibility of servicing

facilities, but also to prevent any possible damage to the customer's home or articles therein.

### Periodic Inspection

The importance of regular, periodic inspection should be stressed to the customer, since minor troubles may thus be detected and remedied before they necessitate major repairs. Impress upon him that your service organization is trained and equipped to render this service at a nominal charge, and that upon request, his name will be placed on your service-record card system. These periodic visits to the customer's home prove profitable in another way, for quite often other appliances in his home require attention.

---

### A New Merchandising Idea

**T**HE Refrigerating & Power Specialties Company, an aggressive West Coast Refrigeration Wholesaler, with warehouses at San Francisco, Portland, Seattle and Tacoma, has developed a unique and beneficial method of bringing the latest developments in the refrigeration industry direct to their customers' door.

They specially designed and built a 21 foot trailer—shown in the accompanying illustration—which well advertises the firm and the manufacturers they represent, and puts particular emphasis on the fact that sales are "wholesale only". The interior of the trailer is very modern in design and has displays representing practically the complete products of the manufacturers represented.

When the trailer is traveling in Northern California, the lines displayed in it will be those of the Brunner Manufacturing Company, Peerless of America and Sporlan Valve Company—all laid out in an attractive manner with explanatory labels and posters.

When the trailer travels into the Oregon and Washington territory, the Universal Cooler line of Condensing Units, Compressors and parts will replace the line of the Brunner Manufacturing Company.

The Universal Cooler display will also

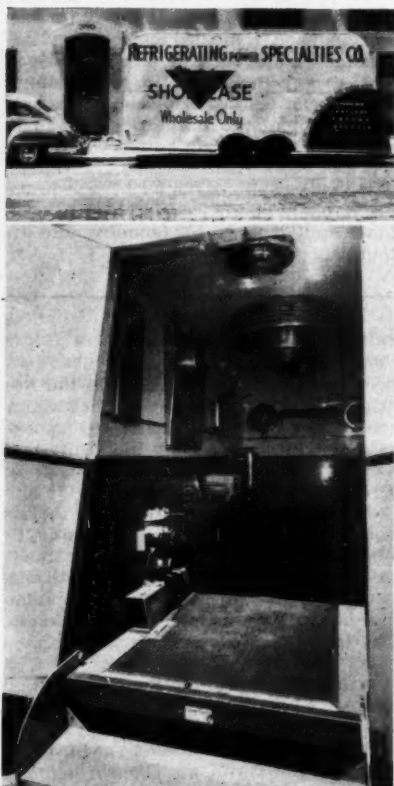
serve to announce the fact that the Refrigerating & Power Specialties Company have just been appointed as exclusive distributors of the Universal Cooler Condensing line in the states of Oregon and Washington.

During the past month, this "mobile showcase" has been traveling throughout the Northern California territory, and has met with the most gratifying acceptance for its sponsors. The opinion has been expressed many times that the Refrigerating & Power Specialties Company is very definitely performing a worthwhile service for the refrigeration industry, as the refrigeration dealer is acquainted with all the new products and the up-to-date methods of installation at first-hand.

The trailer carries a 100 ft. reel of heavy electric cord, which can be run into the Dealer's office or shop for the purpose of obtaining current to operate the various unit cooler motors; thereby putting the display into action.

Included in the trailer is a display board, on which are mounted various Sporlan Expansion Valves, Solenoid Valves, Strainers and "Catchalls". When on a visit, it has been the practice to first invite the dealer and the members of his organization to go over the Sporlan expansion valve line item by item, starting with valves of the smallest ca-

capacity and working on up to the air-conditioning valves and then into the ammonia valves. From experience, it has been found that the salesman and the customer can together work out problems which have arisen during service and installation work. Each



Exterior and interior view of the mobile show case built by a West Coast wholesaler to display equipment to service companies.

customer usually has some "sticker" which can be solved. The solenoid valves, strainers, and "catchalls" are then taken up in order. Due to the wide scope of the Sporlan line, it becomes ideally suited to such a demonstration.

The Peerless coil line is next on the program; dome coolers usually being taken up first, and then followed by

the new-style unit coolers and cascade coolers. A great deal of interest has been shown in this line, particularly because of the fact that several unique engineering advantages have been incorporated. The workmanship of the line admirably lends itself to proper display and points such as the new unit coolers being equipped with round cores rather than the conventional square cores has proved most interesting. The case coils and flash coolers, the ice makers, heat exchangers and cold plates are then taken up in order.

The final line on the program consists of the condensing units of Brunner Manufacturing Company and Universal Cooler Corporation. Condensing units are displayed in sizes from  $\frac{1}{4}$  hp. up to 1 hp. in air-cooled, and 2 hp. water-cooled. Separate compressor bodies of various sizes have also been installed.

A catalogue rack, containing the latest bulletins and engineering data on the equipment displayed, is part of the unit.

The company reports that they intend to periodically renew the display and to bring the trailer to the door of every refrigeration dealer and service organization in Northern California, Oregon and Washington.

★ ★ ★

### Storage of Bone Tissue

ONE of the newer applications of low temperature refrigeration in medicine is in connection with the work now being done in human bone grafting at the New York Orthopaedic Hospital and the Hospital for Special Surgery. Bone tissues used in surgical grafting must be stored at a temperature of  $-10^{\circ}\text{F}$ . in bone banks which are similar in function to refrigerated blood banks.

The most suitable equipment which physicians of the New York Orthopaedic Hospital found when the bank was first started was a standard model home freezer, and while this equipment has served well as a bone bank in the past, it has limitations which specialists believe can be eliminated if some manufacturer will design a cabinet specifically for bone tissue storage.

This is only one of the special applications of refrigeration in which some specialized design is needed.

# Dismantling the Mills Direct Drive Unit

AT first glance one would get the impression that the Mills direct drive condensing unit is of the hermetic or semi-hermetic type. This, however, is not true, since the Mills unit is of the open direct drive type employing a compressor seal between the motor and compressor.

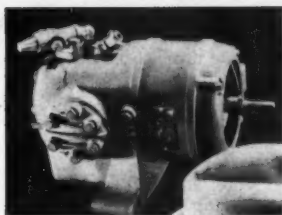
Service procedure on the unit is essentially the same as on any of the open type units whether of the direct drive type or belt driven type, but because of the compact construction of the two cylinder compressor some difficulty may be experienced in dismantling it if the proper procedure is not followed. The following instructions, if followed, should save time and possible damage to the unit.

## To Add Oil to Compressor

1. Install compound gauge.
2. Operate unit and close suction shut-off valve slowly until gauge shows 2 to 3 pounds pressure.
3. Stop unit and close suction valve all the way.
4. Loosen the  $\frac{3}{8}$ " plug or elbow located on top left-hand side of compressor, letting the pressure purge out slowly.
5. When pressure is all out of compressor, remove plug or elbow.
6. Pour the amount of oil needed through the plug hole. A refrigeration oil of 150 viscosity should be used.
7. Replace the plug or elbow, using a sealing compound on its threads. Before tightening plug or elbow, open suction valve slightly and allow some gas to escape through the plug opening.
8. Tighten plug or elbow and open suction valve all the way.

## To Remove Compressor and Motor from Frame

1. Close all three service valves.
2. Loosen flare nut on liquid return line, from condenser to receiver tank, to



The Mills 1/3 hp. direct drive unit.

allow gas in compressor and condenser to escape.

3. Disconnect discharge line from the top of compressor body.

4. Remove the spring clamp that holds the relay box in place, located on left-hand side of compressor frame. (If equipped with Wagner or Westinghouse motor, only pull out 3-prong plug, located on top of relay box.)

5. Remove the four hex cap screws (two on each side) from the compressor body that holds the compressor in the spring cradle.

6. Slide the compressor body, motor and fan out of the spring cradle.

## To Re-install Compressor and Motor to Frame

1. Place motor and compressor into spring cradle.
2. Re-install the four hex head cap screws (two on each side) through the spring cradle and tighten into the compressor.
3. Connect the discharge line onto the discharge fitting located on the top of the compressor.
4. Use spring clamp to clamp relay box in place. (If equipped with Wagner or Westinghouse motor, re-insert 3-prong plug to top of relay box.)

## To Remove Motor from Compressor

1. Remove compressor and motor from frame as explained previously.
2. Remove the fan from the shaft by loosening the two set screws (located in fan hub) and slide fan off of the shaft.
3. Remove the four nuts from the front of the motor housing.
4. Slide the motor bell and motor stator off of the four studs. If motor

stator does not slide off easily, tap it and pull on motor stator at the same time.

5. Remove the rotor retaining nut and spacer from shaft.

6. Slide rotor off shaft. The rotor is provided with holes for removal by means of a wheel puller or hooks if necessary.

Note: Do not use too much force when removing rotor, as this may cause injury to the seal. Never use a screw-driver or bar to pry rotor off shaft.

7. Remove the four studs that hold the motor stator on. These studs screw out of the compressor body.

### To Re-install Motor on Compressor

1. Re-install the four studs that hold the motor stator on, by screwing them into the compressor body.

2. Re-install motor rotor on shaft.

3. Slide rotor spacer onto the shaft. Re-install rotor retaining nut and tighten.

4. Slide motor stator and motor bell cap onto the four studs.

5. Re-install the nuts on the studs and tighten evenly.

6. Slide fan onto shaft and tighten in place with the two set screws, located in fan hub, being sure that one (1) set

screw lines up with countersunk hole on shaft.

7. Check fan and condenser for proper clearance. Turn fan by hand.

### To Remove Seal

1. Remove motor as explained previously.

2. Remove thrust screw, located on back of compressor body, being sure not to lose the steel ball and spring that is located under thrust nut.

3. Remove the six machine screws from the seal housing that is located on the motor end of the compressor.

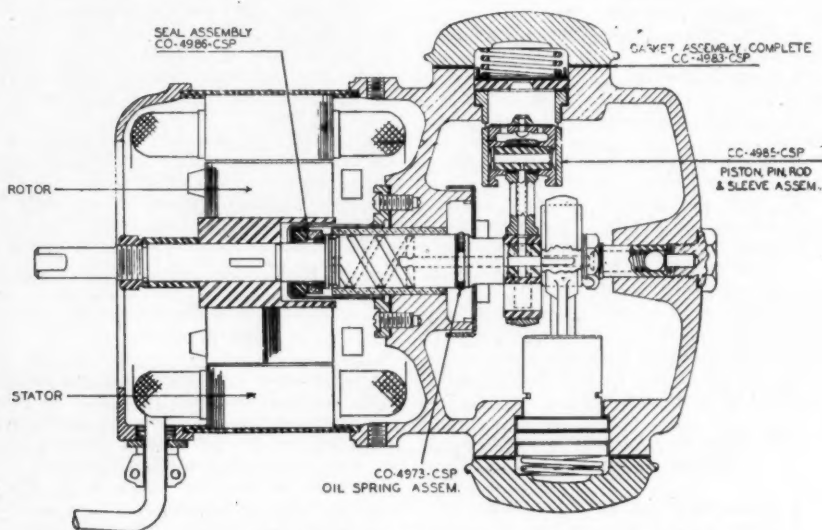
4. Remove the seal housing by sliding it over the shaft.

5. Remove the bronze seal ring and neoprene gasket by sliding them from the shaft.

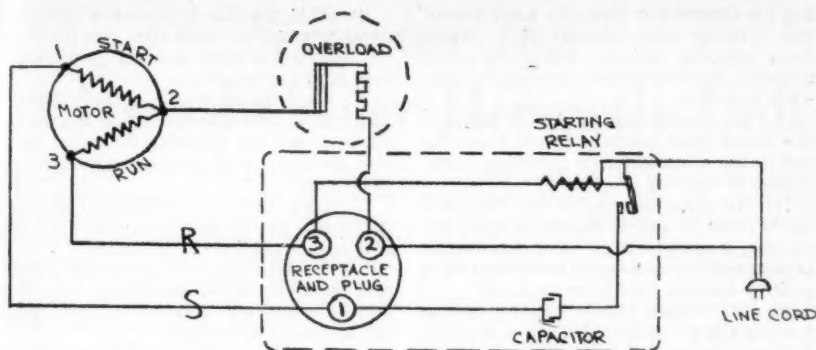
6. To remove the steel seal shoulder and neoprene gasket, located inside the seal housing, pry carefully out of the housing.

### To Remove Valve Plate

1. Remove the cylinder head by removing the six hex head cap screws from it. These screws must be removed evenly because of a spring pressure that is ex-



Cross sectional view of the Mills two cylinder direct drive unit.



Wiring diagram for units equipped with Wagner or Westinghouse motors.

erted under the cylinder head.

2. Remove the cylinder head spring and spring cup.

3. Remove the discharge valve damper, noting the position of the valve damper over the discharge valve.

4. Remove the discharge valve, being careful not to bend or mar it.

5. Remove the valve plate located under the discharge valve and also the lead gasket located under the valve plate.

### To Disassemble Compressor

1. Remove compressor and motor from frame as explained previously.

2. Remove motor and seal as explained previously.

3. Drain all of the oil from the compressor body by removing the plug, located in the top of the compressor.

4. Remove the 12 hex head cap screws

from the bottom cover plate.

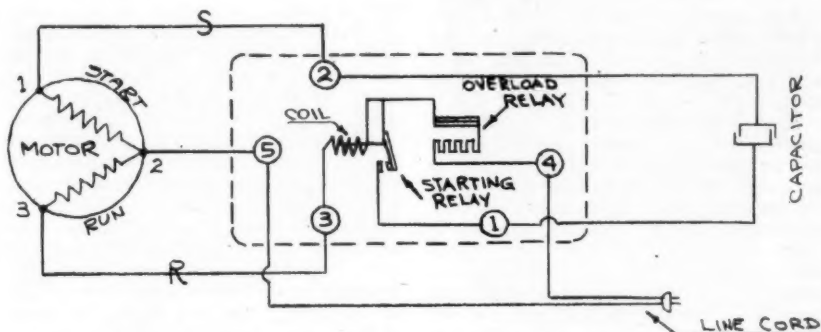
5. Lift the bottom cover plate sufficiently to permit removal of the oil spring from idler sheave.

6. Remove the shaft nut, located on the thrust end of the shaft next to the connecting rod, by bending the point of the lockwasher up off the nut and unscrewing the nut. As nut is unscrewed, pull on the motor end of the shaft. When nut has been removed, the shaft can then be removed by pulling it out from the motor end of the compressor.

7. Remove the eccentrics, connecting rods and pistons by sliding the piston out of the cylinder sleeve.

8. Remove the cylinder heads, cylinder head springs and spring cups, discharge valve dampers and discharge valves, valve plates and valve plate gaskets as explained previously.

9. Remove the cylinder sleeve by slid-



Wiring diagram for units equipped with General Electric motors.



ing the sleeves out from the head side of the cylinder and remove lead gasket from cylinder sleeve. Keep the same cylinder sleeve with the same piston that were together.

10. To remove the oil baffle, take out the round head machine screw from the inside top of compressor and then baffle is free to remove.

11. The main bearing of the compressor is press fit and to remove it from the housing is not practical. If main bearing replacement is necessary, the entire compressor housing should be replaced.

12. The intake valve, located on the head of the piston is fitted on at the factory and removal is not practical. If an intake valve replacement is necessary, the entire piston, pin, rod and sleeve assembly should be replaced.

### To. Reassemble Compressor

1. Re-install the oil baffle plate.

2. Re-install cylinder sleeves. Be sure a new lead gasket is used on the sleeve.

3. Re-install a new lead gasket under valve plates and install valve plates.

4. Re-install the discharge valve and valve dampers. Be sure the tongue of the damper is over the loose end of the discharge valve.

5. Place spring cups and cylinder head springs into place. Install gaskets and cylinder heads (use a new gasket). Draw screws down evenly.

6. Lay the oil spring between the oil baffle plate and the compressor body, so that the oil spring will be looped over the shaft when the shaft is installed. This spring cannot be put in if the shaft is installed first.

7. Start the shaft into the compressor.

8. Slide the eccentrics into the connecting rods. The eccentrics do not have to be forced and will slide into place easily if lined up with the connecting rod.

9. Slide the pistons into the cylinder sleeve bores, and slide the shaft through the eccentrics. Be sure that the second eccentric, that the shaft goes through, is on opposite the first eccentric, so that when the shaft is turned and the eccentrics are in place, the pistons will both slide in and out of the sleeve bores at the same time. Note: The pistons do not have to be forced into the sleeves when they are lined up, they will slide into place.

10. Slide the star lockwasher onto the thrust end of the shaft with one point of the lockwasher bent so it will go into the hole of the eccentric.

11. Start the shaft nut on and tighten into place. Bend a point of the lockwasher (the one opposite the point bent into the hole of the eccentric) over the shaft nut.

12. Slide the bronze seal ring and neoprene seal gasket onto the shaft with the seal gasket against the shoulder.

13. Slide the neoprene gasket and steel seal shoulder, as an assembly, into the bottom of the seal housing with the gasket against the bottom.

14. Use a new seal housing gasket and slide seal housing into place onto the shaft. Put in screws and draw them all up evenly.

15. Re-install thrust spring, steel ball, and thrust screw. Use a new gasket under the thrust screw and tighten down. Note: Pull shaft toward motor end to permit seal surfaces to meet before tightening thrust screw. This avoids binding of connecting rods.

16. Use a new bottom cover plate gasket and hold bottom cover plate over opening. Slip oil spring over idler sheave. Be sure oil spring has not slipped over and in back of oil sheave. Also be sure the oil spring is in its groove on the shaft.

17. Re-install the hex head cap screws in bottom cover plate and draw them down evenly.

18. Refill through suction port opening with 20 ounces of 150 viscosity refrigeration oil.

★ ★ ★

### How to Measure Starting Torque of a Machine

THE torque required to drive a machine can be measured with a simple pulley, string, and weights or spring balance. The pulley is fastened to the shaft, as shown in the diagram, and weights are loaded on a string wound around the pulley, until the pulley turns. The torque in ounce-inches or in pound-feet is found by multiplying the radius of the pulley in inches by the weight in ounces or pounds. A spring balance may be substituted for the weights, and the scale read just as the load moves. Allowance must be made for the weight of the scale. The test should be made at the point where the starting load is greatest.



# *Servicing the* **Universal Cooler Hermetic Unit**

**T**HE 1948 line of Universal Cooler hermetic compressors and condensing units feature a soundly designed motor compressor mechanism that is hermetically sealed within a case welded steel shell. All moving parts are supplied with an ample supply of oil under pressure. All bearings, connecting rods and wrist pins are force feed lubricated from a vane type rotary oil pump. An oversized oil pump screen insures against any foreign material reaching the moving parts.

A charging valve is located in a convenient position on all motor compressor assemblies. This valve opens to the suction side of the compressor and requires a standard type charging valve tool for servicing.

The motor compressor assembly for the single cylinder models, 1/5 and 1/4 hp., is internally spring mounted to the lower of the two heavy steel housings which are welded together to form the housing assembly. To aid in cooling the compressor when it is in operation, a stream of oil is continually played against the inside of the upper housing by means of an oil slinger tube located in the end of the crankshaft.

The twin cylinder motor compressor assembly, 1/4, 1/2 and 1/2 hp., is pressed into the upper housing of the external shell assembly and cooling is effected

by actual contact of the motor stator with the steel shell. The twin compressor is externally mounted on four spring mounts.

**The information presented in these pages is taken with permission from the Universal Cooler hermetic service manual. It is intended to help the service engineer gain a working knowledge of the service problems that may confront him in the service field.**

All relays and thermoguards are mounted directly on the compressor assembly, thus eliminating long connecting wires that would be necessary if these parts were mounted remote. By mounting the thermal overload in close contact with the compressor housing, it will react to heat of the compressor as well as current consumption, thus assuring positive motor protection. A relay cover protects the relay, thermoguard and compressor motor terminals from mechanical damage and possible electrical shorts.

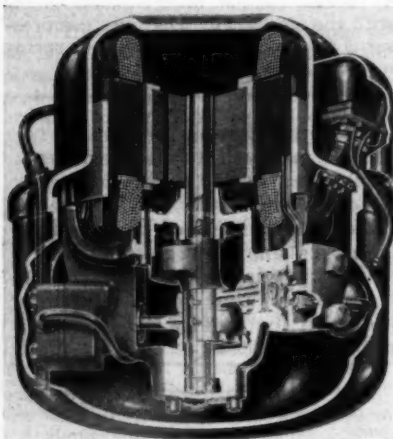


Single cylinder motor compressor assembly.



Twin cylinder motor compressor assembly.

Motor compressor assemblies are supplied with either split phase motors or capacitor motors. Units using split phase motor compressor assemblies are for use with balanced systems only. The units using capacitor type motor compressors are supplied with liquid receivers and



Cut-away view of twin cylinder assembly.

are for use with systems employing an expansion valve or other type of metering device on which a split phase type motor would not be satisfactory.

### Explanation of Electrical System

Although the thermoguard and relay assemblies are not subject to field repair or adjustment, their functions and physical arrangements are reviewed to insure their being thoroughly understood.

One of the two leads from the incoming electrical supply is fastened to post "2" of the relay and the other lead is fastened to post "L" of the relay. Both of these terminals are on the right side when facing the relay.

Leads from the control are attached to posts "1" and "2" of the relay. When the control closes its circuit, current flows from post "2" through the control circuit and the control contacts post "1" on the relay thereby completing the circuit from post "2" to post "1" of the relay.

Note: If a control is not used, a

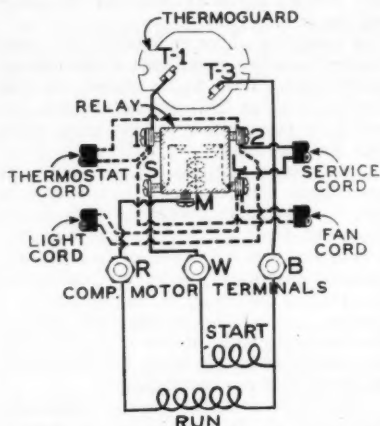
jumper should be placed between posts "1" and "2" on the relay to complete this circuit.

### Thermoguard

The current flow through the thermoguard is from post "1" on the relay to post "T-1" on the thermoguard, through the thermoguard to post "T-3" of thermoguard and thence to terminal "B"

H-49558-C

IF CONTROL  
IS NOT USED  
PLACE JUMPER WIRE  
FROM RELAY 1 TO RELAY 2



Wiring diagram for single cylinder 1/8 and 1/5 hp. units.

of the motor compressor assembly. Terminal "B" is the common terminal for both the starting and running windings.

The thermoguard is simply a bi-metallic disc actuated switch wired in series with a resistance element. The assembly is mounted on the side of the motor compressor assembly so that one side of the bi-metallic disc faces, and is sufficiently near the motor compressor housing to be affected by its temperature. The resistance element is located on the other side of the disc in close proximity that any abnormal temperature induced in it by excessive current requirements will affect the bi-

metallic disc, causing it to snap open and break the circuit, stopping the motor compressor assembly.

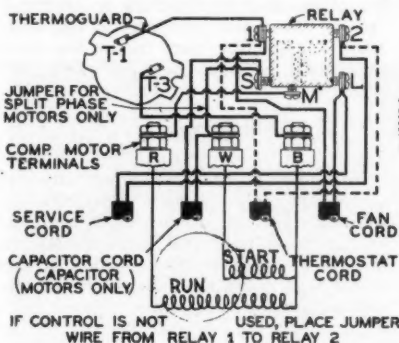
It should be remembered that the thermoguard will automatically reset itself when it has cooled sufficiently.

The resistance elements employed in a thermoguard are selected in respect to the maximum allowable current established for the motor with which it is used. Similarly, the bi-metallic discs are calibrated according to the amount of heat required to operate them, and are

further factory adjusted in assembly in direct relationship to the resistance element with which they are used.

Thermoguards, therefore, which field examination indicate have failed are subject only to exact replacement. They cannot be repaired and there can be no substitution for an exact replacement.

As has been pointed out before, a thermoguard will automatically reset itself upon cooling and accordingly, a unit, may cycle by the operation of this part indefinitely. In cold weather such an occurrence might be detected only by a gradual increase in temperature of the fixture being served by the unit. Under any condition, however, it may readily be determined when the thermoguard is controlling unit operation by paying close attention to the control through a running cycle. If the control contacts remain closed when the unit stops, it is an indication of the thermoguard stopping the unit.



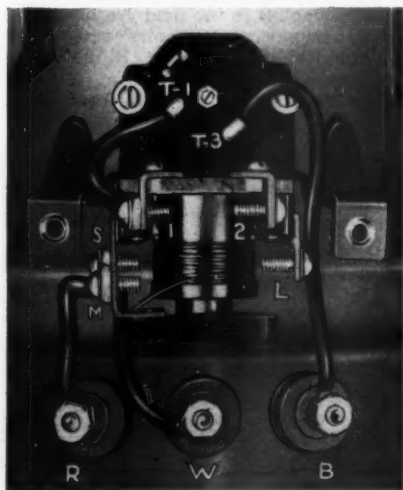
Wiring diagram for twin cylinder 1/4 and 1/3 hp. units.

## Relay

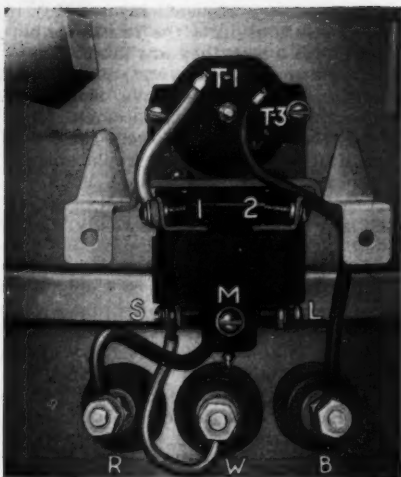
The flow of current from post "L" of the relay is through the relay coil to post "M" of the relay and on to terminal "R" of the motor compressor assembly. Terminal "R" of the motor compressor carries current for the running winding of the motor.

Since the starting torque of the running winding is not equal to the starting load of the compressor, an additional winding for starting purposes is incorporated in the motor. It is for this winding that the relay is employed. The current flow from post "L" as indicated previously, continues to post "M" through the relay coil. At the instant that power is first applied to the running winding during the starting operation, the flow of current is much greater than the current required for normal running operation. This heavy flow of current through the relay coil causes the coil to be energized and moves a contact closing the circuit between posts "L" and "S" on the relay. Current can now flow from the post "L" through the relay contacts to post "S" and thence to terminal "W" of the motor compressor assembly. Terminal "W" of the motor compressor carries current for the starting winding of the motor.

As soon as the running and starting



Arrangement of electrical equipment for 1/8 and 1/5 hp. units using Westinghouse motor and relay.



Arrangement of electrical equipment for 1/8 and 1/5 hp. units using Delco motor and Spencer relay.

windings of the motor receive a supply of current, the motor compressor assembly will begin to operate. When the motor attains normal running speed the flow of current through the relay coil is reduced since the running winding no longer requires the heavy flow of current. As the flow of current is reduced, the relay coil is de-energized and the circuit between post "L" and "S" is broken, thus breaking the circuit to post "W" and the starting winding. Thus, the starting winding circuit only remains closed until the motor compressor reaches a predetermined speed at which time it is disconnected from the circuit by the relay.

Relays furnished on Universal Cooler hermetic units may be either Spencer or Westinghouse, depending on whether the motor is Delco or Westinghouse respectively.

Although both relays are solenoid magnetic type, they are easily distinguished from each other because the Spencer is totally enclosed and the Westinghouse is an open coil design.

The parts are however, in most cases, not interchangeable as a result of their having been factory calibrated for the motors with which they are used. Further, because of this precise calibration,

they do not permit field repairs or adjustments, but must be replaced complete.

### Starting Capacitor

Condensing units employing a "capacitor start" type of motor compressor assembly are designed for applications using a metering device other than the capillary tube.

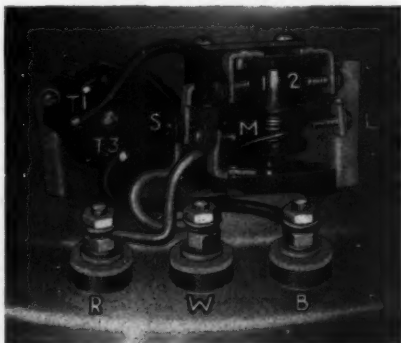
One lead of the starting capacitor is attached to post "S" of the relay and the other lead is attached to terminal "W" of the motor compressor. On units using a capacitor start motor the wire connection between post "S" and "W" is omitted.

### Fan Motor

One lead of the fan motor (on fan cooled units) is attached to post "L" of the relay and the other lead is attached to post "1" of the relay. By attaching the fan motor leads to these posts, the fan motor will operate whenever the motor compressor operates.

### Field Service

The services that may be rendered on the hermetically sealed motor compressor assemblies in the field are limited to external electrical repairs and minor mechanical adjustments. If the motor compressor is determined at fault, it must be removed from the condensing



Arrangement of electrical equipment for 1/4 and 1/3 hp. units using Westinghouse motor and relay.

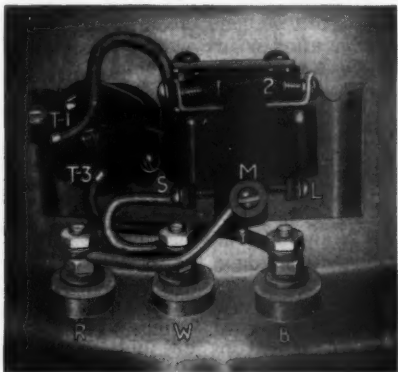
unit or refrigerating system of which it is a part, and an exact replacement from factory service should be installed.

If it is determined, through a service analysis that the motor compressor assembly is at fault, a complete and thorough check should be made of the electrical system.

### Check the Electrical System

Note: Be sure that voltage is correct as outlined under "Low Voltage."

1. Check the wall plug receptacle with the test light.



Arrangement of electrical equipment for 1/4 and 1/3 hp. Delco motor and Spencer Relay.

2. Remove the terminal cover on the motor compressor assembly and check all wires, being sure that each wire is attached to the correct post and that all terminals are tight and free from corrosion.

3. With the unit service cord plugged in, the test light across the following terminals must light. Be sure to make tests in following sequence:

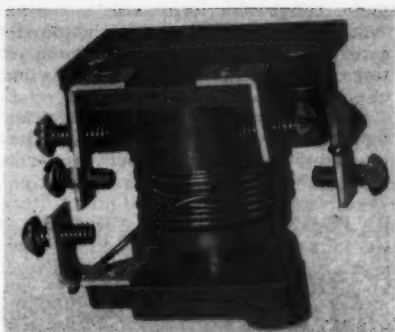
(A) "L" and "2"—no light—check service cord.

(B) "L" and "1" make sure that control contacts are closed—no light — check control circuit.

(C) "M" and "2"—no light—relay coil open—replace relay.

(D) "M" and "T-1"—no light—check wire between "1" and "T-1".

(E) "M" and "T-3"—no light—thermoguard may be tripped. Allow 10 minutes to cool—if no light after 10



Westinghouse relay.

minutes, replace thermoguard.

(F) "M" and "B"—no light—check wire between "B" and "T-3".

(G) "B" and "R"—no light—check wire between "M" and "R".

(H) Place jumper between "L" and "S"—if unit starts, relay is not operating—replace. (If unit does not start, leave jumper in place and continue with tests.)

(I) "B" and "W"—no light—check between "S" and "W" (on capacitor type units wire "S" - "W" is not used.)

If the trouble cannot be located by using the above tests, the relay should be replaced, using an exact duplicate replacement. The new relay will eliminate any possibility of relay trouble due to incorrect pick-up or drop-out characteristics.

If the motor compressor assembly still fails to operate properly after performing the foregoing operations, and the serviceman is sure that some defect, such as a capillary restriction or an overcharge of refrigerant is not causing an unnatural load on the motor compressor, it can be assumed that the motor compressor assembly has internal defects and accordingly should be replaced. However, before condemning a motor compressor assembly for internal defects, the following check should be made to verify the serviceman's analysis.

### Checking Motor Compressor (Split Phase Type)

1. Remove service cord from wall outlet.
2. Disconnect the wires from the three



motor compressor terminals.

3. Using a 10 ampere fuse in the test cord and a jumper, attach one clip of test cord to terminal "B" and the other clip to terminal "R".

4. Plug test cord into an electrical outlet that is known to be good and immediately place a jumper between terminals "R" and "W". If the motor com-



Spencer relay.

pressor is not defective, it should start immediately, and should continue to run when the jumper is removed.

Caution: Do not leave jumper wire between "W" and "R" for more than 15 seconds or the starting winding may be damaged.

### Checking Motor Compressor (Capacitor Start Type)

The test procedure for checking the capacitor start motor compressor is identical with the procedure outlined for testing split phase motor compressors, except that a capacitor must be used in the starting circuit.

1. Remove service cord from wall outlet.

2. Disconnect the wires from the three motor compressor terminals.

3. Using a 10 ampere fuse in the test cord, attach one clip to terminal "B" and the other clip to terminal "R".

4. Place a jumper between terminal "R" of the motor compressor and one post of a 380-420 mfd. auxiliary capacitor, known to be in good condition.

5. Plug the test cord into an electrical outlet known to be good, and immediately place another jumper between terminal "W" and the other post of the capacitor. If the motor compressor is not defective, it should start immediately and continue to operate when the jumper is removed.

If the motor compressor fails to operate when connected "direct" as outlined above, the motor compressor assembly should be replaced.

### Low Voltage

Probably one of the most frequent causes of trouble in the operation of any refrigeration system will be low voltage. For this reason it is recommended that the serviceman carry an accurate voltmeter with him at all times. If a doubt exists as to whether or not the unit is getting the correct voltage, the voltmeter should be used.

The voltage should always be checked across terminals "L" and "2" on the relay to eliminate any possibilities of high resistance joints in the service cord that may be giving trouble. Extension cords should not be used unless the wire size is sufficient to carry the amperage required for starting the unit. To get a true indication of the voltage, it is necessary to have all loads i.e., appliances, etc., connected to the circuit during the voltage test. With all electrical apparatus operating, the refrigerating machine should be started, watching the voltmeter, and noting the lowest point to which the voltage drops. If the voltage drops below 105 volts, it should be considered too low and the necessary changes made to correct the condition before proceeding with any further service.

A low voltage condition may cause the following:

1. Unit will not start.
2. Unit overheating.
3. Unit cycling on thermoguard.
4. Burned relay and thermoguard contacts.

### Causes of Low Voltage

Low voltage may be caused by any one or a combination of the following:

1. Extension cords that are too small



to carry the amperage required by the refrigerating unit.

2. Loose or corroded joints or terminals in the wiring circuit of the refrigerating unit or in the building wiring.

3. Building wiring that is too small or overloaded by the addition of too many pieces of electrical equipment on the same circuit.

4. Loose or corroded terminals and connections in the main fuse or switch box. Also loose or defective fuses.

5. Insufficient voltage furnished by the power company due to overloaded distribution lines, transformers or service entrance lines.

## Adding Refrigerant

Universal Cooler hermetic condensing units are designed for either Freon-12 or Freon-22 refrigerants only. Be sure to accurately determine the type of refrigerant required and add only that type. Freon-22 cannot be used in a system designed for Freon-12, nor can Freon-12 be used in a system designed for Freon-22.

Do not allow refrigerant pressure to exceed 30 Psi. during charging operation as indicated on gauge attached to charging valve tool. Do not charge liquid into motor compressor.

The correct charge of refrigerant in a system using a capillary tube type of metering device is determined when the frost line on the evaporator or coil is at or near the suction line connection to

the evaporator or coil. An undercharge of refrigerant is indicated when the suction line is cold or frosting at the compressor assembly. Systems using a capillary tube have, in most cases, a very critical refrigerant charge and the addition of one or two ounces of refrigerant will cause an overcharged condition. For this reason, the charging of refrigerant should be accomplished very slowly, the best method being to charge a small amount of refrigerant and then close the charging valve and wait a few minutes to see where the frost line ends before continuing.

The correct charge of refrigerant with an expansion valve type of metering device is determinable by a refrigerant "sight gauge" installed in the liquid line immediately after the receiver outlet valve. The correct charge is obtained when the "white bubbles" disappear in the sight gauge glass. It is general practice to add an additional "reserve" charge after the white bubbles disappear. The amount of the reserve charge will depend on the type and size of system. Care should be taken not to overcharge the system to the point where the complete refrigerant charge could not be pumped into the receiver.

## Oil Charge

Motor compressor assemblies supplied by the factory are charged with 48 ounces of Suniso 3G refrigerant oil. Since there is no simple means of deter-

## Unit Specifications

Compressor						Capacity in Btu. per Hour (90° Ambient Temperature)						
						Evaporating			Suction Temperature			
Model No.	Motor Hp.	No. Cyl.	Bore	Stroke	Disp. C.F. per Hr.	40°	30°	20°	10°	0°	-10°	-20°
S18L0-1	1/8	1	1 1/8	9/16	34.			1085	842	644	473	332
S18L7-1	1/8	1	1 1/8	9/16	34.			1085	842	644	473	332
S18L8-1	1/8	1	1 1/8	9/16	34.			1085	842	644	473	332
S158L0-1	1/8	1	1 1/8	.72	43.5				1140	880	660	480
S18H7-1	1/8	1	1 1/8	9/16	34.	1680	1360	1085	842	644		
S15L1-1	1/6	1	1 1/8	.72	43.5	2200	1830	1456	1145	880	660	480
S15L8-1	1/6	1	1 1/8	.72	43.5			1380	1140	880	660	480
S14L1-1	1/4	2	1 1/8	9/16	68.	2950	2485	2030	1650	1300	1000	780
C14L1-1	1/4	2	1 1/8	9/16	68.	2950	2485	2030	1650	1300	1000	780
S134L1-1	1/4	2	1 1/8	.72	87.				2260	1830	1400	1080
C134L1-1	1/4	2	1 1/8	.72	87.				2260	1830	1400	1080
S14H1-1	1/3	2	1 1/8	9/16	68.	3000	2500	2040	1650	1300		
C14H1-1	1/3	2	1 1/8	9/16	68.	3000	2500	2040	1650	1300		
S13L1-1	1/3	2	1 1/8	.72	87.	3610	3080	2740	2260	1830		
C13L1-1	1/3	2	1 1/8	.72	87.	3610	3080	2740	2260	1830		
S123L1-1	1/3	2	1 1/8	.72	102.				2420	1920	1500	1210
C123L1-1	1/3	2	1 1/8	.72	102.				2420	1920	1500	1210
C122H1-1	1/2	2	1 1/8	.72	102.	4450	3670	2985	2430	1920		

mining the oil charge in the field, it is not recommended that oil be added by the service engineer in the field. The loss of two or three ounces of oil due to a leak or spillage will not affect the unit operation and should not be considered serious.

### Moisture

The presence of moisture in a refrigeration system is probably one of the most common causes of abnormal operation. In the case of refrigerants known as the "halogenated hydrocarbons" such as the "Freons" a limited amount of the water combines with the refrigerant and the rest of the moisture circulates with the refrigerant. This "free moisture" continues to circulate in the system until it reaches a point where the temperature is below freezing and then ice crystals are formed and the refrigerant flow is restricted or completely stopped.

The presence of moisture is indicated by long or continuous operation with little or no refrigeration and suction pressures that are much lower than normal. Many times the presence of moisture is confused with a defective expansion valve or a restricted strainer or capillary tube. A simple way to determine if abnormal operation is caused by moisture is to stop the condensing unit and warm all the parts of the evaporator or low side to a temperature above 32 F. If normal operation is obtained when the condensing unit is then started, it can be assumed that moisture was causing the abnormal operation.

### Moisture Removal

Small quantities of moisture can be removed from the refrigeration system by discharging all of the refrigerant in the system, installing a good dehydrator and recharging with new refrigerant.

Note: It is not recommended that any anti-freeze agent be added to a hermetic refrigerating system. To do so will void the warranty.

### Restricted Refrigerant Flow (Capillary Systems)

A plugged or restricted strainer or capillary tube will affect the refrigeration system in much the same manner as moisture; that is, long or continuous operation with little or no refrigeration

and suction pressures that are much lower than normal. However, a plugged or restricted condition caused by foreign material other than moisture cannot be overcome by stopping the condensing unit and allowing the system to warm up above 32 F.

If abnormal operation is definitely determined to be caused by foreign material other than moisture restricting the flow of refrigerant, the strainer and capillary assembly should be removed from the system and blown out or replaced as follows:

1. Remove the sealing screw from the charging port on the side of the motor compressor and install the charging valve tool on which a compound gauge has been mounted.

2. Open the charging valve to the gauge. If the gauge reading indicates a vacuum, refrigerant must be added to bring the pressure above zero pounds gauge so that air and moisture will not be admitted when the system is opened.

3. With refrigerant pressure above zero pounds disconnect the discharge line from the motor compressor assembly and immediately seal the discharge fitting on the motor compressor. Disconnect the suction line from the motor compressor and immediately seal the suction fitting of the motor compressor.

4. Attach a drum of anhydrous carbon dioxide (CO<sub>2</sub>), equipped with a pressure regulating valve, to the suction line using a "tee" arrangement and a 300 pound pressure gauge.

5. Wrap a cloth around the open end of the liquid line and slowly open the valve on the drum of CO<sub>2</sub> until pressure reaches approximately 250 pounds.

Warning: Be sure that you do not exceed the test pressure of the evaporator or lowside. Under no condition should the pressure exceed 250 pounds per square inch.

6. If the restriction cannot be cleared by applying pressure, the capillary tube and strainer should be replaced, using an exact replacement obtained from the manufacturer of the complete cabinet or fixture inasmuch as the capillary must be engineered to fit the balance of the system.

7. If the restriction can be cleared by applying pressure and blowing out the lowside, the suction line should be removed from the drum of CO<sub>2</sub> and con-

nected to the suction fitting of the motor compressor. Do not remove the seal cap from the discharge fitting of the motor compressor at this time.

8. Attach a charging line to the charging valve tool and connect the charging line to a drum of the correct refrigerant.

9. Open the charging drum valve and the charging port on the motor compressor, suction line, evaporator or low-side, capillary tube, condenser and out through the discharge line, thereby purging all CO<sub>2</sub> and air from the complete system. This purging operation should be continued until the serviceman is sure all air and CO<sub>2</sub> is removed. Due to the fact that the purging must be

done through the capillary, some time will be required for this operation because of the pressure drop through the small diameter capillary line.

10. After all air and CO<sub>2</sub> has been purged out, the charging drum valve may be closed, the seal removed from the discharge fitting of the motor compressor and the discharge line connected to the compressor discharge fitting. This operation should be performed quickly so that air and moisture will not enter the system.

11. Make sure that all connections and fittings are tight. The system can then be charged with the correct refrigerant as outlined under "Adding Refrigerant."

### Selection of Gaskets and Their Installation

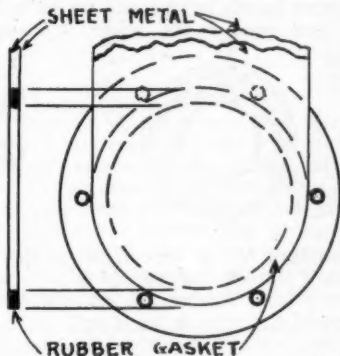
**I**n the selection of gaskets there are a number of things that must often be considered. For instance, to what temperature will the gasket be subjected? Temperature has much to do with proper selection. Thus if the gasket will not be heated above 240 deg. F. it can be a non-metallic gasket. If it will be heated to a range between 240 and 800 deg. F. an asbestos or asbestos covered gasket may serve the purpose. And if the temperature will run above 800 deg. F. a metal gasket usually gives the best service.

What is the nature of the flange surface? It should be smooth, preferably, to facilitate perfect sealing. Perfect contact between the gasket and flange surface is essential to assure tightness and prevent leakage. Rough flange surfaces, such as we all too commonly see, are a liability. The notion that roughness is necessary to prevent gasket slippage is fallacious.

How can I install a thin and flimsy gasket between flanges already in place in a pipe line? This is a common question. The accompanying sketch shows how it has been successfully accomplished on large pipes with thin and flimsy rubber gaskets that were giving much trouble because of folding or buckling.

Let us say, for example, that you have a pipe joint that has been unbolted and the old gasket has been removed. The problem is to install a new gasket in place of the old one and be certain

that it has not folded or buckled and that it is in its proper place. Do it in this way: Cut out two pieces of sheet metal as indicated in the sketch, one end be-



ing rounded to the exact curvature of the bolt circle, which is the same as the outside curvature of the gasket. Place the gasket between the two pieces of sheet metal as shown in the sectional view, and then insert the assembly carefully between the flanges to the position shown in the sketch. Then carefully withdraw one of the pieces of sheet metal, and then the other, leaving the gasket behind in correct position for bolting.

Before inserting the gasket between the pieces of sheet metal, make certain that no surface is "sticky" at any point so that the position of the gasket will not be disturbed when the pieces of sheet metal are withdrawn.—Submitted by W. F. Schaphorst, Newark, N. J.

# SERVICE

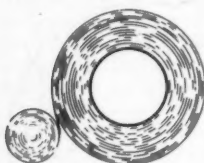


# POINTERS

A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

## HANDLING TAPE

THE electrical wiring of refrigeration systems can, at times, become an irritating problem. Especially so when you have to tape spliced wire in close places. Usually there will be more than one wire to tape. Rather than tear off a short length to tape and try to tuck it in and around the splice, I make a



miniature roll of tape right on the big roll. I tear off this roll and with my first and second fingers and thumb, roll it around the wire to be taped.

You will be surprised to find how neatly, quickly and tightly you can tape a splice in a spot so close that your hand won't fit in. You see, you only use your finger tips to unroll the miniature roll around the splice.—Submitted by John W. Fox, Salisbury, N. C.

★ ★ ★

## BOILING OIL OUT EVAPORATORS

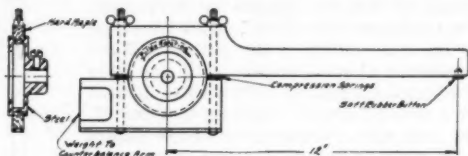
I DRIVE the excess oil out of the flood type evaporators back to the compressor with an electric water heater (Heat King-made in Des Moines). I use an old bread pan, 10" x 17" x 2-1/2" or 10" x 14" x 2 1/2". I place this under the evaporator, then raise it up so bottom of evaporator will be immersed in the water that is added. The heating

element in the water is plugged into the line. The evaporator temperature can easily be raised to the boiling point. I hold it at the boiling point longer than 30 minutes.—Submitted by W. Douglas Carter, Blair, Nebr.

★ ★ ★

## Measuring Torque

THE torque of a motor is its turning force. This should not be confused with horsepower, because power is a measurement of the amount of work that a motor can do in a given time while torque is its turning force—the pull it will exert at a given radius,



whether the shaft turns or not.

In large motors torque is usually measured in pound-feet. In fractional horsepower motors, because of their diminutive size, the torque is usually measured in ounce-inches. The equation used to express T (torque) = Force (force) x r (radius). Applying this equation to a simple problem, we find that a motor which will just lift a four-ounce weight located two inches from the center of the shaft exerts a torque of 8 oz-in.

★ ★ ★

## SPECIAL ELBOW FITTINGS FOR GAUGE CONNECTIONS

AFTER removing the 1/8 plug from a compressor service valves to install a gauge line, it is often found advisable to use an elbow fitting to avoid a very sharp bend in the gauge line. To install an elbow is mean because it cannot be turned all the way around without get-



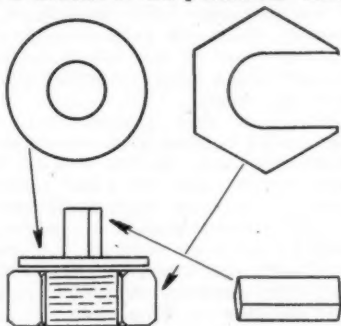
ting several different angles of purchase on it with a small crescent wrench, and very often the elbow flare thread suffers as a result of this getting a grip at various angles.

To simplify this task I carry several  $\frac{1}{8}$ " pipe x  $\frac{1}{4}$ " flare elbows in my kit to which I have silver soldered a  $\frac{1}{2}$ " hex nut or bolt head. Thus my valve stem ratchet wrench which has already been used to remove the  $\frac{1}{8}$  plug is at hand and is all that is necessary to install the elbow easily and quickly.—Submitted by J. W. Gibb, Vancouver, B. C.

★ ★ ★

### WRENCH ADAPTER

**A**N ADAPTER can be made to prevent damaging  $\frac{1}{8}$ " pipe to  $\frac{1}{4}$ " flare el as is usually the case when full swing of a wrench is not permitted. Take a



hexagon nut from a  $\frac{1}{2}$ " bolt, saw out a section of the nut the width of the el. Silver solder a washer to the nut, force a  $\frac{1}{4}$ " square rod into the washer hole and silver solder. Cut off rod about  $\frac{3}{8}$ " long and you have an adapter any service valve ratchet wrench can handle.—Submitted by Henry B. Boyce, San Leandro, Calif.

★ ★ ★

### WHY DO COIL RATINGS VARY?

**T**HE "K" factor of a coil will vary from one make and from one application to another, depending upon constructional features and the manner in which it is installed. A few of the vari-

ables affecting the "K" value are:

(1) Ratio of primary surface to secondary surface

- A. Fins per inch
- B. Size fin used
- C. Diameter of tubing used

(2) Rate of air flow over coil

- A. Forced convection or gravity flow
- B. Baffling arrangements which affect air flow

(3) Height of coil—whether it is 2, 3, 4 or more tubes high.

**AVERAGE "K" FACTOR FOR GRAVITY FIN COILS HAVING 3-INCH SQUARE FINS ON  $\frac{5}{8}$ -INCH TUBING. EXPRESSED IN BTU. PER SQUARE FOOT PER DEGREE F., T.Q.**

Tubes High	Fins Per Inch		
	2	2.5	3
2	1.15	.95	.75
3	1.05	.85	.70
4	.90	.70	.60
5	.75	.60	.50
6	.65	.50	.40
7	.50	.40	.35
8	.40	.30	.25

It is impossible to quote "K" factors which would accurately apply to all the different conditions encountered. However, the accompanying table shows approximate factors for coils under average conditions, having 3-inch square fins on  $\frac{5}{8}$ -inch tubing. Fin spacing used in this table are 2,  $2\frac{1}{2}$  and 3 per inch on coils from 2 to 8 tubes high.



"Quittin' time already? Kinda hate to knock off today."



# QUESTIONS



# ANSWERS

## Mills Ice Cream Maker

**QUESTION 829:** Eighteen months ago I replaced a seal on a 1 hp. water-cooled Mills compressor operating a Mills ice cream maker and storage cabinet model 30-434. This machine had lost all its methyl and on replacing the compressor I pulled a full vacuum on the system, replaced the oil which was Suniso of 150 viscosity, put on a silica gel drier, and an ounce of Thawzone as the system had filled with air when it lost the gas charge.

This system operated trouble free for about fourteen months when the Detroit 673 on the storage cabinet stuck shut. I replaced the valve with a 673 M10 low temperature valve and about a week later it appeared to freeze up as heat opened it. I installed a new drier in the liquid line, but the valve continued to stick shut. Again I changed the valve, but it still continues to stick shut. No trouble occurs in the other T.E.V. controlling the ice cream maker. The machine operates at about 10 degrees below zero working at roughly 15 inches back pressure but almost every time a batch of ice cream is made the valve on the hardening cabinet appears to freeze shut.

After operating for fourteen months without moisture trouble I can't see that this is occurring now though heat will open the valve. Head pressure is 75 lbs. and no trace of air in the system so I am wondering if it is the oil which is causing this trouble. Would appreciate any help on this and if it is oil, how it may be corrected.

**ANSWER:** From the information given, we would judge that a leak has developed on the low side of the system through which moisture is entering. The leak would probably be at the valve outlet, coil outlet, or some other fitting in the low side that is normally frosted or sweating. It is possible to have a

small leak that will take in a considerable amount of water without taking in enough air to raise a head pressure appreciably. This would discount a leak at the compressor seal.

We don't believe the trouble is due to wax separating out of the oil because of the 14 months of trouble-free operation.

With a moisture condition present, the lowest temperature valve would always be affected first; so it is normal that the freezer expansion valve is operating properly.

We would suggest that you check over the low side very carefully for leaks. Because of the check valve in the suction line of the cabinet, it is necessary to let the cabinet warm up to get pressure in the coil or replace the check valve with a coupling while testing for leaks.

Once in a while a system will be found taking in water through a cracked compressor head. If the rest of the system checks tight, you might connect the water to by-pass the head. We heard of a very unusual leak which was corrected by a service engineer this summer. Both diaphragms of the water valve were ruptured, and with a city water pressure of 120 pounds, the system was taking in water through the high side.

We are sure that when you build up the pressure on the low side and check over carefully, you will find the leak.

★ ★ ★

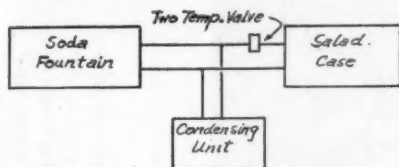
## Fountain Frosts Back

**QUESTION 830:** I have been working on a Bastian-Blessing 60 gal. fountain that takes spells frosting back on suction line to compressor. I did not install the unit. The nut on suction line at compressor was not frostproof and has collapsed the line.

Apparently the trouble is in water cooler. I believe it is a Johnson with Frigidaire regulating valve LTV20—



Frig. expansion valve 12 AC (Freon). The compressor is in the basement under fountain — Copeland water cooled — Model 100 WFL.



No trouble holding dipping cream at 8 degrees—syrup rail OK. Customer complains of water dripping on stock in basement. Job installed January, 1948. What should I look for?

**ANSWER** by A. F. McMahon, Bastian-Blessing Co.: The difficulty encountered could be due to more than one source. In the first place our general practice on the soda fountain unit itself is to use the cold ice cream coil in the manner of a surge tank to prevent short-cycling of the condensing unit. However, we realize that in order to do that requires special controlling and special valves which are provided when the equipment leaves the factory.

For example, the expansion valve on the ice cream coil is a gas charged limited suction pressure valve. It is limited to 10 lbs. suction pressure. Furthermore, our method of control is to use a low pressure control on the condensing unit wired electrically parallel and not in series with a temperature control installed in the fountain. The low pressure control on the condensing unit you set to function on the water cooler, that is, the settings are kept relatively high.

We recommend a cut-in point of about 25 lbs. pressure and a cut-out point of about 7 lbs. pressure. Obviously those pressure settings are much too high to refrigerate the ice cream section. But the ice cream is refrigerated by the temperature control which will close the circuit when required and keep the condensing unit operating in spite of the fact that the low pressure control will open. No additional refrigeration will be accomplished in the water cooler because of the constant pressure valve with which it is equipped. Consequently the compressor suction pressure goes on down to about 1 or 2 lbs. at which point refrigeration is accomplished and the ice cream sets.

Now if the expansion valve on the ice cream section is replaced and an incorrect valve used, obviously a frost back can result, because when the water cooler is used and the relatively warm vapor from the water cooler enters the cold ice cream refrigeration coil, it enters at the tail end of the coil at the point where the expansion valve capillary tube is connected. Consequently, the first effect would be to warm up the expansion valve bulb and cause the valve to open.

However, by using the limited suction pressure 10 lbs. valve on that coil, the pressure jumps up to 10 lbs. or more before the bulb even starts to warm up. Consequently the expansion valve does not open and the amount of vapor only which recondenses in the coil is not enough to cause an actual frosting. We know that from experience. But it is apparent therefore that the expansion valve, if it is replaced, must be replaced with an exact duplicate. It is also apparent that the controls must be set according to our specifications to function properly.

There is still another possibility in this particular instance in that the sketch shows a salad case also operating in the same condensing unit with a two temperature valve controlling the temperature. Now since the salad unit operates at a relatively high temperature, it probably refrigerates both when the water cooler is operated and when the ice cream is demanding refrigeration. Consequently, it is understandable that this unit might be a contributing factor. Particularly since the controlling temperature valve seems to be operating on the suction line rather than cutting off the liquid line as would be the case with a solenoid.

I would suggest that you verify the control settings as I have given them and verify the fact that the expansion valve on the creamer unit is the proper one and determine whether or not the source of the frostback is the salad unit or the fountain itself. Nevertheless in every case where refrigeration equipment is installed with suction lines passing through a storage space or wareroom, where perishable merchandise is stored, we think it is desirable in every case that the lines be insulated to prevent dripping because in spite of the fact that normal operation should not produce frost or sweating, there is always the possibility

*Simplify Your Service...  
Improve Your  
Multiple Temperature Systems...*

with these



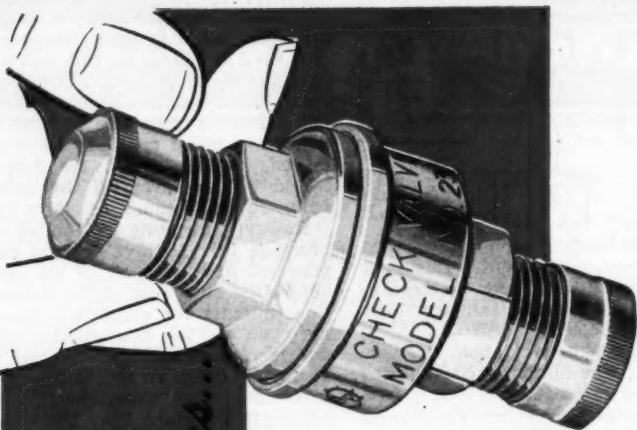
**DEPENDABLE**

Refrigeration Valves



**MODEL 234**

**REFRIGERANT CHECK VALVE**



• The new A-P Model 234 Refrigerant Check Valve is an effective companion to the popular A-P Model 235-S Suction Pressure Valve — where two or more evaporators must operate at differing temperatures with one condensing unit. The new Check Valve is installed in the outlet line of the lower-temperature evaporator

to prevent the back flow of gas from high to low temperature. Several new design and construction features make the new A-P

Model 234 particularly valuable for service engineers. It can be installed in any position in the line. Self-aligning stainless steel valve discs are individually ground and lap-fitted to the seat for a perfect and positive closure. With its precision built forged brass body, accurately machined bronze seat and minimum number of internal parts, it assures a long life of trouble-free service. For more information, contact your distributor, A-P Refrigeration, or write for literature. See bulletin No. A-P-300, or new condensed catalog.

brass body, accurately machined bronze seat and minimum number of internal parts, it assures a long life of trouble-free service. For more information, contact the Automatic Products Company, Milwaukee, Wis., or write for bulletin No. M-200, or new condensed catalog.

is installed in the outlet line of the lower-temperature evaporator to prevent the back flow of gas from high to low temperature. Several new design and construction features make the new A-P

**INDISPENSABLE . . . FOR MULTIPLE SYSTEMS**



**DEPENDABLE Model 235-S**

**SUCTION PRESSURE REGULATING VALVE**

A-P Model 235-S is well-known for its ability to provide faster, closer, more accurate control of evaporator pressures on multiple systems. Maintains constant pressure regardless of load change. Can be adjusted to system immediately, with adjusting knob and graduated visible scale on collar. No waiting for system to settle down. Capacity, up to 1/2-ton Freon, 3/4-ton Methyl or Sulphur. Pressure adjustment from 0" vacuum to 40 lbs. At your wholesaler — or write for bulletin M-110, or new condensed catalog.

**AUTOMATIC PRODUCTS COMPANY**

2454 North Thirty-Second Street  
MILWAUKEE 10, WISCONSIN

Export Department, 13 East 40th Street, New York 16, N. Y.

L-502



**DEPENDABLE**

**REFRIGERATION VALVES**

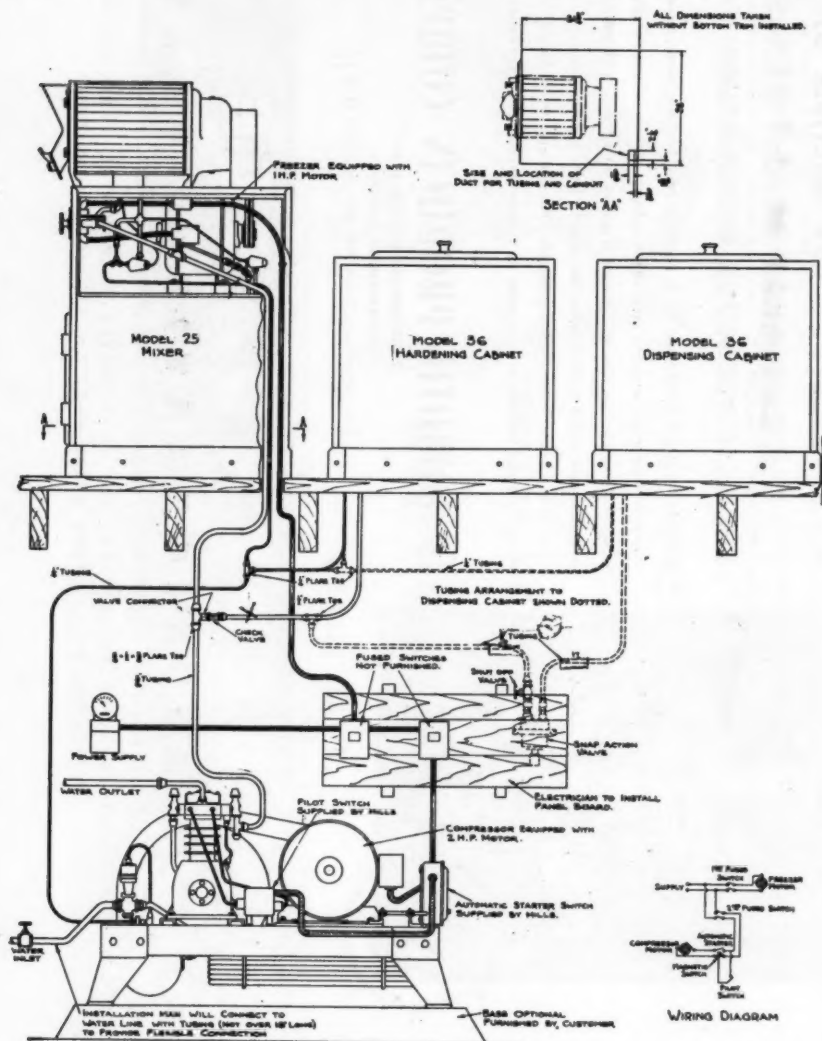
STOCKED AND SOLD BY GOOD REFRIGERATION WHOLESALERS EVERYWHERE . . . RECOMMENDED AND  
INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS



that a faulty or sticking expansion valve or a valve that leaks just a little bit at the needle seat, not enough to seriously interfere with the operation of the units, may cause damage to merchandise out of all proportions to the importance of the trouble itself from a refrigeration standpoint.

## Result of Mixing Refrigerants

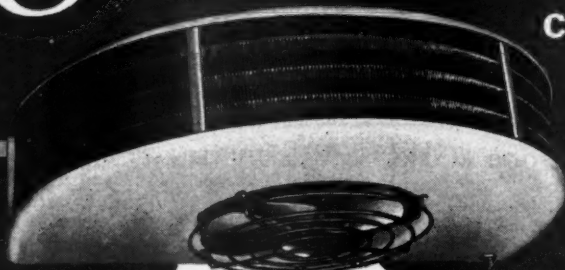
**QUESTION 831:** We have a Mills ice cream hardening cabinet in connection with a Mills ice cream freezer head, operating with one 1½ hp. water cooled condensing unit, charged with methyl chloride. My serviceman, the other day



Typical installation of an early model Mills ice cream freezer and hardening cabinet.

# Takes No Storage Space

FROM  
A  
COOLER



*Filterpure*

MOUNTS  
AGAINST  
CEILING  
NEXT TO  
WALL

## HALF ROUND CEILING UNIT

For Walk-ins and Florist Boxes.

Installed on the ceiling adjacent to wall, completely out of the way. Cooler is blanketed with low velocity air, with a relative humidity in excess of 85% thru a 180° arc. Equipped with Air Purification—Built-in Louvres—Built-in Liquid Distributor—Slide Hangers. Made in 6 popular sizes from 260 to 867 BTU per 1° TD. Highly efficient, compact, streamlined.

*Sold by Leading Refrigeration Wholesalers*

**BETZ CORPORATION**  
HAMMOND • INDIANA

by mistake, added 2 lbs. of Freon before he discovered the job was charged with methyl. At the present time the job is operating satisfactorily with about 10 or 12 lbs. of methyl and 2 lbs. of Freon.

I have been in the refrigeration business for 22 years and it is the first time I have run into a predicament of this type and would like to know what the results are going to be. If the results are not good, I will discharge all of the refrigerant and recharge.

ANSWER: As far as I can determine, no trouble will result because of the addition of Freon to the methyl chloride ice cream freezer. It is good that it happened this way and not the reverse. In other words, had the system been charged with Freon and methyl added, then you would be concerned with the possibility that aluminum or some other

such metal is contained in the system and would be affected by the methyl chloride. However, since this system was charged with methyl we know that no such metals are used and that there will be no reaction by the addition of Freon.

There is a possibility that a slight rise in head pressure will occur due to the addition of Freon. However, with only two pounds in a total of ten or twelve pounds of refrigerant I don't think that the head pressure increase will be noticeable.

The only other possibility of trouble is the inclination for the refrigerants to separate at certain points in the system which at times may cause erratic operation. However, here again because of the small amount of Freon in comparison with the total amount of refrigerant I don't believe that any trouble will be experienced.

## THE MODERN FOOD MARKET

THE modern food store or market has come a long way since the day that ice was the only means of cooling, and a few electric lights and one motor for the coffee grinder were the only electric load. Now the modern store stocks large quantities of perishable and out

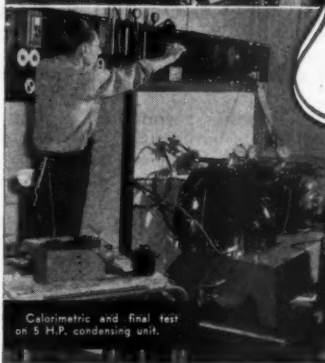
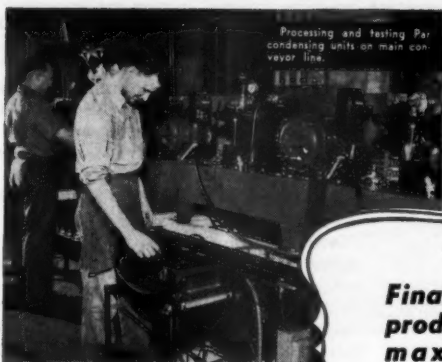
of season foods at close to freezing or below freezing temperatures. The market is lighted to nearly daylight intensity and mechanization has taken over many difficult and time absorbing jobs.

As an example of what we mean let's take a look at one of the modern food markets of today, many of which will

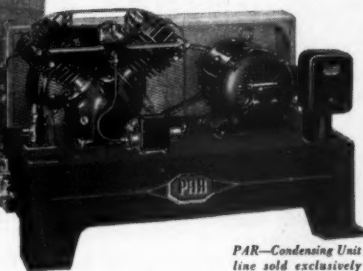


The modern food market is one of the largest users of electrical equipment among the retail group.





**Final testing on Lynch production Line assures maximum efficiency and performance of PAR condensing units**



*PAR—Condensing Unit line sold exclusively through Franchised Refrigeration Equipment Wholesalers!*

When you buy Par you are assured of maximum efficiency and performance . . . for every Par unit must meet the rigid specifications of final testing before delivery . . . another step in the production of Par condensing units geared to precision manufacture.

Par, also, gives blanket coverage in a wide range of models and sizes from 1/6 h.p. to 5 h.p. . . . domestic and commercial units for self-contained applications and heavy duty commercial units in air and water cooled models. There's a proper type, proper size Par unit to permit "tailored-installations" for maximum economy, efficiency and performance.

Ask your Par wholesaler for details or write for illustrated catalog and specifications.

*By Comparison—You'll Buy PAR*

**LYNCH CORPORATION**

*Par Compressor Division*

TOLEDO 1, OHIO U.S.A.

be found across the country. Of particular note in these stores is the amount of electrically run equipment to be found. Included in this equipment is more than 160 lineal feet of display refrigerated cases alone. These displays will be divided into 30 to 35 feet for dairy products; 40 to 45 feet for fresh meats; 30 to 35 feet for lunch meat and cheese; 30 feet for frozen foods; and 30 feet for refrigerated produce.

In addition, the modern food market maintains a pre-packaging or cutting room which will be held at the temperature of 55 degrees. Throughout the store are required from 12 to 20 condensing units serving the various refrigerated fixtures and the cutting room, and in addition, electric motors will be required for such things as the heating system, air circulators, cash registers, meat and coffee grinder, meat saw and slicer. The total motors in the modern store will range from 30 to 50. In addition to this electrical load, the lighting of the modern store will require more than 300 fluorescent lamp tubes. This figure includes ceiling lights, canopy lights and lights in display cases, but does not include incandescent lamps used in walk-in coolers and backroom storage areas.

The modern store of today is among the largest electric users in the retail business group.

★ ★ ★

### "Air Conditioning" Defined

**J**UST WHAT is air conditioning? The constantly expanding use of air conditioning in homes and in commercial and industrial establishments makes this an important definition.

Authorities on the subject—architects, heating and ventilating engineers and manufacturers agree, and the Federal Trade Commission has ruled that—

Air conditioning is the control, by a mechanical device, of the temperature, humidity and circulation of the air within a structure.

The non-performance of any one of these basic functions takes equipment out of the air conditioning class, according to numerous rulings of the Federal Trade Commission. (See FTC Stipulations 1467, 1772, 1883, 2450 and Docket 3974)

Air conditioning equipment for summer comfort, cools, dehumidifies and circulates the air.

Winter air conditioning equipment warms, humidifies and circulates the air.

Year-round air conditioning equipment combines the functions of both summer and winter air conditioning equipment.

Air conditioning equipment may do more than control the temperature, humidity and movement of air. It may, for example, filter the air to remove dust, bacteria and pollens. However, the three functions of controlling temperature, humidity and movement are the functions recognized by trade and government authorities as MINIMUM FUNCTIONS of air conditioning equipment.

The Bureau recommends that if equipment is advertised as providing "air conditioning" or as being an "air conditioner," it offer, as a minimum, the control of the temperature, humidity and movement of air within an enclosed space.

★ ★ ★

### Low Temperature Equipment for the Medical Profession

**I**NCREASING use of refrigeration in medicine presents a challenge to manufacturers of refrigerating equipment because such equipment must of necessity be custom built with a very limited production at a cost within the limitations of medical budgets. Some manufacturers, however, are cooperating with medical research staffs in order to meet their needs.

One case, for example, is a low temperature chest recently constructed by the J. P. Pfeiffer Company of Baltimore for the Poliomyelitis Research Center at Johns Hopkins University in Baltimore.

It is essential that after each experiment with polio serum has been completed, the specimen of serum be catalogued and stored for future reference under conditions which will preserve the serum and its anti-bodies in a complete state of dormancy. The J. P. Pfeiffer Company designed an ingenious cabinet which provides storage space for about two thousand 1 cc. vials of blood serums at a temperature of -40 F.

# Electromatic



## NON-REFILLABLE DRIERS

- Finest Deluxe Quality
- Precision Engineered
- Pressure Tested Twice for Maximum Service

All brass-copper construction for long life. Inlet screen bound with brass ring is 50 x 40 mesh brass. Outlet is 100 mesh monel screen plus a pure white wool felt disc of refrigeration quality which acts as a highly effective strainer.

Filled with dust-free refrigeration grade Silica Gel. For the best, buy Electromatic!

**Ask Your Wholesaler!**

# Electromatic

2100 INDIANA AVE. CHICAGO 16, ILL.

CANADA—2025 ADDINGTON AVE., MONTREAL



## COMING CONVENTIONS

### New England States Association Conference and Exhibits

Place: Hotel Bradford  
City: Boston, Mass.  
Date: October 8, 9 and 10, 1948  
General Chairman: John J. Mad-  
den, 212 Madison Street, Ded-  
ham, Mass.

### 11th Annual RSES Convention and R.E.M.A. Exhibition

Place: Sherman Hotel  
City: Chicago, Illinois  
Date: November 19-22, 1948  
Secretary: H. T. McDermott, 433  
North Waller Ave., Chicago, Ill.

### Illinois State Association

Place: St. Nicholas Hotel  
City: Springfield, Illinois  
Date: September 25 and 26  
Secretary: B. V. Clark, 612 N.  
May Street, Aurora, Illinois.

### Hoosier State Association

Place: Antler Hotel  
City: Indianapolis, Indiana  
Date: October 8, 9 and 10  
Convention Chairman: E. F. Wulf,  
1457 N. Grant Ave., Indianapolis,  
Ind.

### National Association of Refrigeration Contractors

#### Annual Meeting

Place: Sherman Hotel.  
City: Chicago, Illinois.  
Date: November 18 and 19, 1948.  
Executive Vice-President: E. J.  
Helminak, 353 Hippodrome An-  
nex Bldg., Cleveland, Ohio.

### Interprovincial Association

Place: Mt. Royal Hotel  
City: Montreal, Que., Canada  
Date: March 28 and 29, 1949  
Secretary: R. G. Henderson, 38  
Bedford Park Place, Toronto,  
Ont.

## New "Recorded" Program Available

THE Educational Committee has re-  
leased an additional recorded lecture,  
supplementing the list published in the  
June issue of THE REFRIGERATION SER-  
VICE ENGINEER.

The new lecture covers "Truck Re-  
frigeration" by Albert Sawyer, engineer  
for Dole Refrigerating Company. It con-  
sists of six double faced discs, accom-  
panied by twelve slides.

★ ★ ★

## Sciota Auxiliary Formed

ON AUGUST 18th a new member was  
added to the Auxiliary family tree,  
known as the Sciota Auxiliary of Mar-  
ion, Ohio. They have 16 charter mem-  
bers, and the officers are Mrs. Blanche  
C. Morse, **President**; Mrs. Betty Whit-  
tington, **Vice-President**; Mrs. Olive Mil-  
ler, **Secretary**; Mrs. Viola Osmun, **Treas-  
urer**; and Mrs. Avalon Radcliffe, **Ser-  
geant-at-arms**.

Arrangements for the presentation of  
their charter have not yet been com-  
pleted but congratulations are in order  
for the officers and members of this new  
Auxiliary.

★ ★ ★

## Yosemite Chapter Receives Charter

IN THE hustling city of Modesto, Cali-  
fornia the Yosemite Chapter was pre-  
sented with its charter on August 18th  
by International Treasurer M. R. Hanks.  
After a short informal talk, Mr. Hanks  
gave the oath of obligation and then pre-  
sented the charter, following which  
membership cards and certificates were  
personally presented and each member  
welcomed into the Society. Regular  
meetings will be held on the third Wed-  
nesday of each month in a meeting room  
of the Pacific Gas & Electric Building.

Before the close of the evening Mr.  
Hanks conducted a question and answer  
period on matters pertaining to the So-  
ciety.

## Fastest, surest Drying Method ever developed!



1. *Instantaneous drying action gets system running in few minutes.*
2. *Complete drying action down to  $-60^{\circ}$  dew point, by running 3 minutes per pound of refrigerant.*

## DFN MOISTURE CONTROL UNIT

Drying refrigeration systems is reduced to an exact science by the revolutionary DFN Moisture Control Unit. It not only dries with a speed and thoroughness never before obtained, but it also tells whether the system is wet—how wet it is—when it is dry—when a drier needs replacement.

The DFN Moisture Control Unit consists of a high-capacity cartridge-type drier, plus a moisture indicator, completely assembled with controls and mounted on a panel, ready to hook up. Because the dessicant is Ducal Drierite, it operates efficiently at refrigerant temperatures up to  $150^{\circ}\text{F.}$ , permitting easy installation on the liquid line. When the system shows dry, remove Unit, install permanent DFN drier, seal up and future moisture troubles are eliminated. See the DFN Moisture Control Unit at your wholesaler. Write us for detailed literature.

### IT'S PORTABLE

*—dries many jobs in field, shop, factory*

**A single cartridge has the capacity to pick up and hold over 18 teaspoonfuls of water. 100% effective on each job until cartridge is exhausted. When unit is removed, all adsorbed water is carried away with it.**

**McIntire Connector Co.**  
**255 Jefferson St., Newark 5, N.J.**



DON'T MISS THE BIG 3-DAY EASTERN  
REFRIGERATION and AIR CONDITIONING EXHIBIT

# EDUCATIONAL CONFERENCE

HOTEL BRADFORD  
BOSTON MASS.

I'M  
FOR  
LEARNIN'  
MORE  
AND  
EARNIN'  
MORE!



- Educational Exhibits.
- Illustrated Lectures.
- Motion Pictures.
- Educational Talks.
- Question Forum.
- Expert Advice.
- Fun and Fellowship.
- Relaxation.
- Entertainment.

Exhibits  
Open

OCT. 8  
2 to 10

OCT. 9  
12 to 10

OCT. 10  
10 to 3

**3** BIG DAYS



JOIN ALL the *Live Wires* WHO WILL ATTEND!



# NEW!

## MARSH DUO-THERM THERMOMETER

*Guardian of Freezer and  
Refrigerator Operation*

**FREEZER TEMPERATURE  
AND ROOM TEMPERATURE**  
*...both on one easy-  
to-read dial!*



The Duo-Therm Thermometer is the newest development in Marsh refrigeration instruments—and a much needed one! For permanent installation in connection with locker plants, walk-in coolers, even home freezers, it gives the owner a means of continuously checking temperature by merely glancing at the easy-to-read dial of the instrument which is provided with five feet of capillary tubing so that it can be located at any convenient viewing point outside the unit. No need to open doors or remove lids. It also provides a thermometer, combined on the same dial, to indicate room temperature. The upper ("freezer") scale reads from  $-30^{\circ}$  to  $+65^{\circ}$  F.; lower ("room") scale, from  $+20^{\circ}$  to  $+90^{\circ}$  F.

The large easy-to-read figures and markings are a part of the handsome styling throughout. Case is black enameled with chromium rim. Capillary tubing is slender enough to pass between the door and jamb of any type of refrigerator or quick-freeze unit. A convenient mounting bracket is provided so that installation can be made in a few minutes.

Duo-Therm is a "natural" for your customers who operate locker plants, commercial boxes, quick-freeze and storage units in plants, food stores, and homes. It is the finishing touch to every refrigeration job—the constant indicator of the functioning of the refrigeration unit—the safeguard against food spoilage due to power failure, mechanical failure or improper operation.

**Write for complete descriptive literature**

**JAS. P. MARSH CORPORATION, Dept. Q, Skokie, Ill.**

*Export Dept.: 155 E. 44th St., New York 17, N. Y.*

# MARSH

BUY FROM YOUR WHOLESALER

*Refrigeration Instruments*

## Boston Expects 3000 to See 80 Exhibits

**T**HREE thousand refrigeration service engineers, wholesalers, contractors and dealers are expected to attend the First Eastern Refrigeration and Air Conditioning Exhibit and Conference to be held at the Bradford Hotel, in Boston on October 8, 9 and 10.

The very latest developments in refrigeration and air conditioning equipment will be displayed in exhibits by over 80 of the leading manufacturers of the industry in this conference which is being jointly sponsored by the Refrigeration Equipment Manufacturers Association and the Refrigeration Service Engineers Society.

Exhibits will consist of working models, cut-away models, sectional drawings, motion pictures, etc.

Exhibits will be open from 2:00 to 10:00 P.M. on Friday, October 8, from noon to 10:00 P.M. on Saturday, October 9 and from 10:00 A.M. to 3:00 P.M. on Sunday, October 10.

A special program of technical meetings, to be addressed by refrigeration experts, is being arranged by the New England Chapter of the Refrigeration Service Engineers Society. These technical meetings will be held on Saturday and Sunday mornings, October 9 and 10, and will be augmented by a series of educational motion pictures. Speakers to date include Dr. Walter O. Walker, Ansul Chemical Company on "Driers"; George Schuld, International Safety Director of the Refrigeration Service Engineers Society, who will speak on "Refrigeration Safety Hazards"; and L. W. Larsen of Tecumseh Products Company, whose subject will be "Design and Servicing of High Speed Compressors".

Reservations for exhibit space are steadily coming in at this early date with nearly 50 firms already signed up which indicates a very successful conference. Firms which have already made reservations for educational exhibits guarantee a high standard of educational exhibit and include the following:

Ace Cabinet Corp.  
Acme Industries, Inc.  
Airserco Mfg. Co. Inc.  
Alco Valve Co.  
Aminco Refrigeration Products Co.  
Ansul Chemical Co.

Automatic Products Co.  
Brunner Manufacturing Co.  
Bush Manufacturing Co.  
Chicago Seal Co.  
Colbar, Inc.  
Coolstream Corp.  
Copeland Refrigeration Corp.  
Curtis Refrigerating Machine Division  
The Davison Chemical Corp.  
The Dayton Rubber Co.  
Detroit Lubricator Co.  
Dole Refrigerating Co.  
The Ebco Manufacturing Co.  
The Electric Div. of The Simoniz Co.  
Fogel Refrigerator Co.  
General Controls Co.  
General Electric Co., Air Cond. Dept.  
L. H. Gilmer Co.  
Grand Rapids Brass Co.  
Halstead & Mitchell  
Heat-X-Changer Co., Inc.  
Henry Valve Co.  
Highside Chemicals Co.  
The Imperial Brass Manufacturing Co.  
Jarow Products  
Kason Hardware Corp.  
Kerotest Mfg. Co.  
Kramer Trenton Co.  
Lehigh Manufacturing Co.  
Lynch Corporation  
McIntire Connector Co.  
Mills Industries, Inc.  
Minneapolis Show Case & Fixture Co.  
Mitchell Manufacturing Co.  
Mueller Brass Co.  
Nash-Kelvinator Corp.  
National Production & Sales, Inc.  
Ranco Inc.  
Remco, Inc.  
Serval, Inc.  
The A. O. Smith Corp.  
Spencer Thermostat Co.  
Sporlan Valve Co.  
Standard Refrigeration Co.  
Sun Oil Company  
Superior Valve & Fittings Co.  
Tecumseh Products Co.  
Temprite Products Corp.  
Tenney Engineering, Inc.  
The Torrington Mfg. Co.  
Tyler Fixture Corp.  
United Cork Companies  
Virginia Smelting Co.  
Wabash Manufacturing Co.  
Weatherhead Co.  
Westinghouse Electric Corp.  
Wolverine Tube Division



FOR A FREE COPY WRITE:

E. I. du Pont de Nemours & Co. (Inc.)  
Electrochemicals Department  
Wilmington 98, Delaware

**DU PONT  
FOR  
QUALITY**

## DU PONT METHYL CHLORIDE

BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

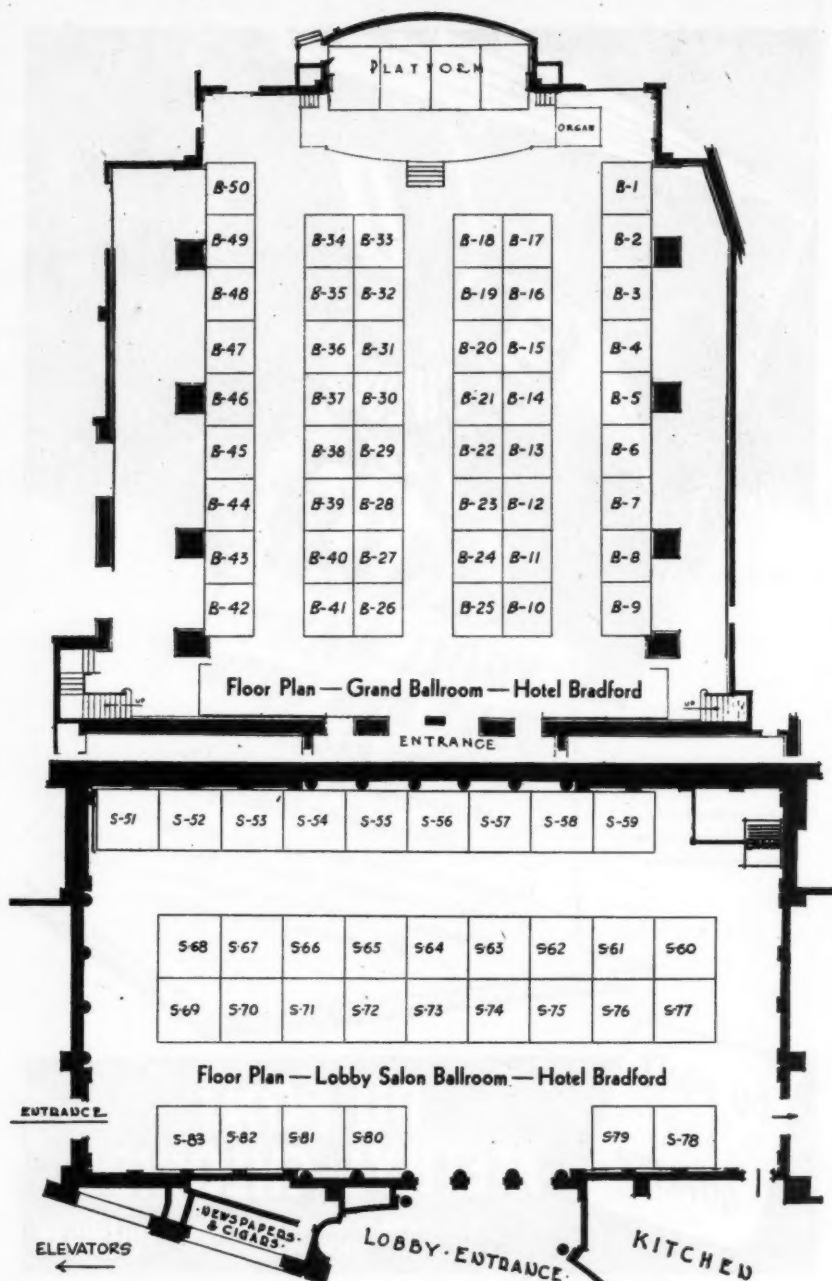


Tune in to Du Pont "Cavalcade of America" Monday nights—8 P.M., EST, NBC.

SERVICE ENGINEER

77

September, 1948



# MORE PROFIT—LESS TIME

Analyze Hermetics without Guesswork

*Let Annie Do It!*

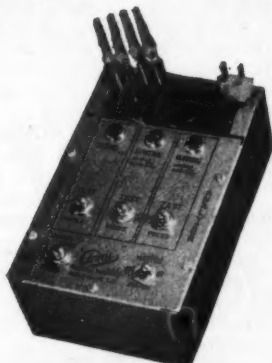
A HERMETIC UNIT ANALYZER which, in a matter of seconds, will positively indicate the nature of any electrical defect.

*Annie*

REVERSES DIRECTION OF RUN  
PROVIDES MANUAL STARTING  
INDICATES OPEN OR GROUNDED FIELDS  
RELEASES STUCK OR FROZEN UNITS—

stuck units can frequently be freed by reversing the running direction.

ACCURATE—you can estimate closely without fear of having to take a loss. A "must" in any repair kit. Don't be embarrassed by your customer asking: "how do you know?"



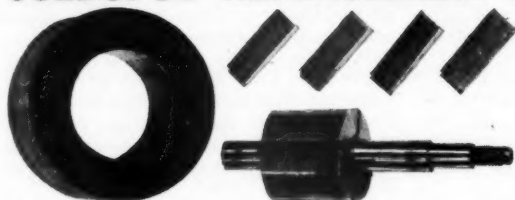
## SPECIFICATIONS

Size: 3" x 5" x 8"

Weight: 1 3/4 pounds

Price: **\$16.50**

## COLDSPOT REPLACEMENT PARTS



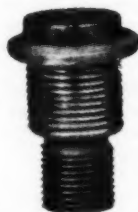
For All Compressors  
Having 15/32 Shafts

Matched  
Set, Each. **\$14.50**

Lots of 3,  
Each..... **\$13.80**

## QUIET COLDSPOT CARBON VANES

Available in 3 Sizes—1"-1 1/4"-1 1/2"  
Each Set .....\$1.25  
Lots of 10 Sets.....\$1.19  
Lots of 25 Sets.....\$1.13



## BELLOWS SEAL

Each .....\$3.00  
Lots of 10..... \$2.85

## Coldspot Check Valve

Stainless Steel Seat; Swedish  
Steel Disc; No Tools Necessary  
to Install in 5 Minutes

Each .....\$2.25  
Lots of 10.....\$2.00



Coldspot  
Drive Couplings  
&  
Dome Gaskets

**MECHANICAL ENTERPRISES** DEPARTMENT 36

**4856 LANKERSHIM BLVD. NORTH HOLLYWOOD, CALIF.**

SERVICE ENGINEER

79

September, 1948

A special program of entertainment and sight-seeing for the ladies promises to be one of the high spots of the Boston gathering.

The conference is open to the entire refrigeration and allied industries. All interested men are invited to attend.

Hotel reservations are being handled by James A. McCue, Chairman of the Housing Committee, 801 Beacon Street, Boston 15, Mass. All reservations will be confirmed by the hotels.

The New England Chapter of the Refrigeration Service Engineers Society, hosts to the convention, expect at least 3,000 people to attend.

Members of the New England Chapter in charge of arrangements includes:

John J. Madden, Dedham, Mass.—General Chairman.

Lee Wallace, New Haven, Conn.—Asst. Genl. Chairman.

Chas. C. E. Harris, Cambridge, Mass.—Coordinator.

Arthur W. Andreen, E. Hartford, Conn.—Arrangements.

James A. McCue, Boston, Mass.—Housing.

Members of the Educational Committee of the Refrigeration Equipment Manufacturers are:

H. F. Spoehrer, St. Louis, Mo., Chairman; K. B. Thorndike, Chicago, Ill.; J. M. Schlemmer, Glendale, Calif.; E. M. Flannery, West Hartford, Conn.; H. F. Hildreth, Springfield, Mass., and G. E. Graff, Columbus, Ohio.

★ ★ ★

### Thomas Heads CARSES

**L**LOYD THOMAS, Monterey, Calif., was elected president of the California Association of the Refrigeration Service Engineers Society following the resignation of William Wharton at the directors' meeting in Fresno on June 27, 1948.

Other officers of the CARSES for 1948-49 are: First Vice-President, Ralph French, San Diego; Second Vice-President, A. M. McClellan, Sacramento; Secretary, Charles Rusten, San Francisco; Assistant Secretary, Charles Bell, Fresno; Treasurer, Stewart Bell, Long Beach; and Sergeant-at-Arms, Sam Grove, Bakersfield.

Board of Directors consist of Hal Crumley, Charles Edwards, Clarence Stumpf, Robert Chambers, Austin Hicks,

Harold McQuay, Charles Rush and William Allison.

Hal Crumley is State Educational Director.

★ ★ ★

### Chicago Prepares for 11th Annual RSES Convention

**P**LANs are rapidly shaping up for the 11th Annual Convention of the Refrigeration Service Engineers Society 11th annual convention in Chicago, November 19, 20, 21 and 22 at the Hotel Sherman, Chicago.

The third regional educational exhibit sponsored by the Refrigeration Equipment Manufacturers Association will be held in conjunction with the annual meeting. The entire mezzanine floor of the hotel will provide for approximately 125 educational exhibits.

Early reservation of rooms is urged and official reservation forms are being mailed to the membership from International headquarters. John Heger, president of Chicago Chapter and Chairman of the Housing Committee, in a letter accompanying the forms states that they will be honored by the official hotel only if received prior to October 17. "Don't wait until that date", cautions Mr. Heger, "as the earlier the forms are received, the better chance you have of securing the required accommodations at or near the rate you desire."

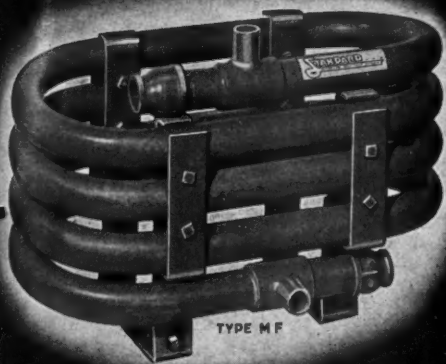
Rates for single rooms at the Hotel Sherman are from \$4.50 to \$8.45; double rooms, \$7.00 to \$10.95; twins \$8.45 to \$11.95.

Rates for two rooms with connecting bath for two persons are \$9.00 and \$9.90; same accommodations for 3 persons, \$11.50 and \$12.40; for four persons, \$14.00 and \$14.90. Rooms accommodating three persons start at \$10.95 and for four persons \$12.45.

Floyd Lilley, Chicago, International RSES Director, is general conference Chairman. E. Riccio, Chicago, and Willis Stafford of Tri-County Chapter, are co-chairmen.

Other committee chairmen include: Housing, John Heger, Chicago Chapter; Entertainment, Dwight Orr, Chicago Chapter; Reception, Daniel J. Gott, Chicago Chapter; Publicity, R. L. Hendrickson, Tri-County Chapter; Registration, Gordon Eubanks, Corn Belt Chapter;





*High Capacity*

**STANDARD**

*Multi-Flow*  
**CONDENSER**

**ECONOMICAL**—The multiple tube design gives rapid heat transfer resulting in low water consumption and high condensing unit capacity. Refrigerant and water travel is at a minimum, thereby reducing pressure drop.

**SIMPLE**—Water flows through a cluster of  $\frac{1}{2}$ " copper tubes in the Multi-flow condenser. Mounting is designed for easy installation.

**CLEANABLE**—Continuous sweeping return bends permit easy cleaning. Simply disconnect the water inlet of the Multi-flow condenser. Then use a plumber's auger turned by hand or electric drill.

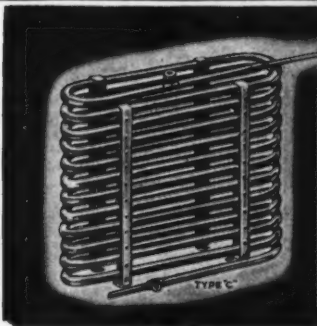
NOW AVAILABLE IN SIZES RANGING FROM  $1\frac{1}{2}$  to 15 H. P.

## TYPE C SERIES

Standard's well-known, all-copper counterflow condenser meets the requirements for high capacity on  $\frac{1}{2}$  to 3 H.P. units. Compact, light, and fabricated on short radius bends for convenience in mounting and replacement.

Write for bulletin C-2.

Sold through leading wholesalers.



**STANDARD** *Refrigeration Co.*

332 S. HOYNE AVE. CHICAGO 12, ILL.

Committee Secretary, B. V. Clark, Tri-County Chapter; Coordinator of Auxiliary Activities, Wm. J. McCarley, Joliet, President Illinois State Association; Assistant to International Sergeant-at-Arms, Eugene Monti, Chicago Chapter.

★ ★ ★

### Springfield Awaits Your Arrival

**A**LL set to entertain you, is the information we get from Springfield, Illinois, which will be the site of the Illinois Association 11th Annual Meeting, September 25 and 26 at the St. Nicholas Hotel.

All set with five highly educational talks, one question and answer session, two business sessions, the annual banquet, and a tour for the ladies through Lincoln's New Salem State Park.

In addition, some 20 tables for the exhibits of manufacturers and wholesalers will provide the opportunity of discussing problems with these suppliers.

That in a "nut shell" is what will occupy your two-day visit to Springfield. Lay aside your work and plan to attend—they are expecting you. Indications are that this will be the best attended Illinois meeting in recent years.

### Nearly 10,000 Members Comprise RSES

**T**HE INTERNATIONAL Secretary's Office has recently compiled the membership count of the International Society as of the end of the fiscal year June 30, 1948. This count does not include the chapters that were chartered subsequently to July 1, 1948.

The following key to the five headings indicates the number of members in the various membership classifications:

- a.—Certificate Members
- b.—Active Members
- c.—Associate Members
- d.—Junior Members
- e.—Total of all members

Four additional chapters entered the select circle of the "over 100 club."

Three of these chapters—Dayton, Ohio; Mount Royal, Montreal; and Akron, Ohio—are old chapters whose membership increase entitled them to this recognition. A newcomer, Garden State Chapter of New Jersey, was chartered shortly before the close of the fiscal year and with 131 members placed ninth in the select list. Nineteen chapters recorded at the end of the fiscal year, a membership of 100 or more. This was an increase of four chapters over the previous report.

### The 19 "Over 100 Club"

Standing as of June, 1948	Standing as of June, 1947	Mem- bers
1 Metropolitan New York .....	2	184
2 Boston .....	1	182
3 Ontario Maple Leaf .....	5	166
4 Greater Chicago ....	3	165
5 Twin Cities .....	4	160
6 Philadelphia .....	9	149
7 Columbus .....	10	133
8 Cleveland .....	7	130
9 Garden State .....	—	131
10 Interprovincial ....	8	127
11 Houston .....	6	124
12 Los Angeles .....	11	116
13 Central Connecticut .....	15	113
14 Trenton .....	12	114
15 St. Louis .....	14	113
16 Monumental .....	13	112
17 Dayton .....	—	111
18 Mount Royal .....	—	111
19 Akron .....	—	105

Metropolitan New York Chapter heads the list by a slim margin, having displaced Boston Chapter which occupied top position in 1947. Ontario Maple Leaf Chapter, Toronto, advanced to third position, up from its previous standing in fifth place.

Among the state and regional associations, the New England States Association, comprising Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island, leads with 954. California with all of its membership confined to the state only, has 835. Ohio follows with 777, with Illinois placing fourth with 593.

# "Genuine Joe" Knows where to go

## for Wagner Motor Parts



### Available—When You Want Them—Where You Want Them

From the Service Building at Wagner's huge plant flows a steady supply of Wagner Assembly-Line Motor Parts to a nationwide network of 450 Authorized Service Stations and Parts Distributors. The signs shown above identify these outlets for you—look for them . . . they mean a complete stock of genuine Wagner parts you want—when and where you want them.

### Use Genuine Wagner Motor Parts for All Replacements

Dependable switches . . . correctly graded brushes . . . pure wool wicks . . . full-finished bi-metal bearings . . . steel-reinforced commutators . . . reliable brush-holder assemblies—whatever parts you need in the rebuilding and repairing of motors, use genuine Wagner parts and have complete confidence in your work. Wagner replacement parts are the same parts that for years have given Wagner motors outstanding performance records throughout the world.



MS48-4

Write for **CATALOG MU-40**

6433 PLYMOUTH AVENUE  
ST. LOUIS 14, MO., U. S. A.

**ELECTRICAL AND AUTOMOTIVE PRODUCTS**

# Membership Count as of July 1, 1948

	A	B	C	D	E
<b>ALABAMA</b>					
Azalea City .....		34	6	3	43
Birmingham .....	12	59	14	9	94
Montgomery .....	7	32	6	4	49
<b>ARIZONA</b>					
Central Arizona .....	6	58	7	15	86
Northern Arizona .....		12			12
Southern Arizona .....		36	1	8	45
<b>CALIFORNIA</b>					
Arrowhead .....	11	59	1	5	76
Fresno .....	7	23	6		36
Golden Gate .....		45	11	3	59
Hub .....		18	2	2	22
Imperial Valley .....		9	3	1	13
Kern County .....		37	2	2	41
Long Beach .....	6	74	9		89
Los Angeles .....	6	82	28		116
Monterey County .....	5	13		2	20
Oakland .....		49	19	1	69
Old Baldy .....	12	14	3		29
Orange County .....	2	26	1	3	31
Sacramento Valley .....	16	9	2	7	27
San Diego .....	7	54	7	3	75
San Fernando .....	1	41	4	1	47
San Gabriel .....	12	39	1	7	59
Yosemite .....		26			26
<b>COLORADO</b>					
Mile High .....	14	36	13	4	67
San Isabel .....	1	23	7	10	41
<b>CONNECTICUT</b>					
Central Connecticut .....		78	20	15	113
Elm City .....	5	57	6	6	74
Fairfield County .....		38	4	9	51
Waterbury .....		21		4	25
<b>DISTRICT OF COLUMBIA</b>		63	8	12	83
<b>FLORIDA</b>					
Florida West Coast .....		29	2	4	35
Miami .....	10	70	15	3	98
Pensacola .....		21	1	4	26
Sunshine City .....	2	31	5	6	44
West Palm Beach .....		1			1
<b>GEORGIA</b>					
Atlanta .....		27	16	3	46
Electric City .....		10	4	2	16
Peach .....		21	2	3	26
<b>ILLINOIS</b>					
Chicago West Towns .....	1	40	3	2	46
Corn Belt .....	7	12	3	2	24
Greater Chicago .....	13	110	38	3	165
Great Lakes .....		38	7	3	48
Illini .....		17	1		18
Illinois Valley .....	11	23	6	9	49
Kankakee Valley .....	2	21	4		27
Little Egypt .....		58	5	6	69
Quincy .....		17		2	19
Rockford .....	3	38	2	1	44
Springfield .....	4	31	1	4	40
Tri County .....	14	26	5		45
<b>INDIANA</b>					
Evansville .....	4	28	10	5	47
Fort Wayne .....		72	7	2	81
Indianapolis .....	6	59	17	9	91
Northern Indiana .....	2	20	2	3	27
<b>IOWA</b>					
Blackhawk .....		25	1	2	28
Cedar Valley .....	6	14	5	2	27
Des Moines .....		10	2	1	13
Key City .....		19	6	1	26
Mississippi Valley .....	7	44	9		60
Sioux City .....		32	5	2	39
Tall Corn .....		19	3	1	23
<b>KANSAS</b>					
Wichita .....	5	43	4	5	57
<b>KENTUCKY</b>					
Colonels .....	13	28	5	2	48
Jackson Purchase .....		9		3	12
<b>LOUISIANA</b>					
Lake Charles .....		12	2	3	17
Louisiana .....		21		6	27
Shreveport .....		30	12	3	45

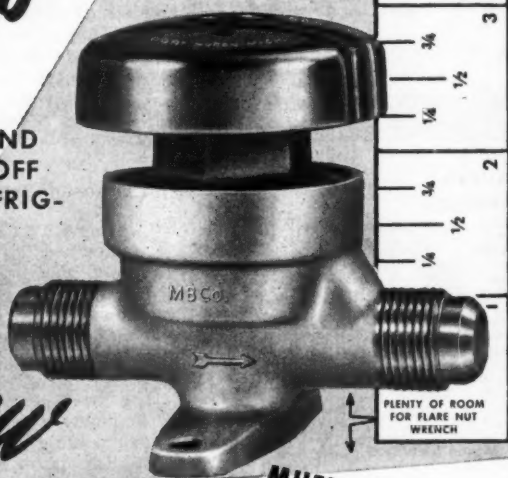
<b>MAINE</b>					
Dirigo .....		70	2	16	88
<b>MARYLAND</b>					
Cumberland Tri		14			14
State .....	1	75	17	19	112
<b>MASSACHUSETTS</b>					
Berkshire County .....		28	3	1	32
Boston .....		128	16	38	182
Western Massa-					
chusetts .....	9	53	9	15	86
Whaling City .....		32	2	20	54
Worcester .....		62	24		86
<b>MICHIGAN</b>					
Greater Detroit .....	3	57	10	3	73
Furniture City .....	10	48	7	5	70
Huron Valley .....		6			6
Motor City .....	10	22	3	6	41
Saginaw Valley .....		14			14
Southwestern					
Michigan .....		42	3	7	52
Wolverine .....	6	15	1	3	25
<b>MINNESOTA</b>					
Head of the Lakes .....		30	2	8	40
Twin Cities .....		110	22	28	160
<b>MISSISSIPPI</b>					
Hinds Junior .....		9		28	37
Magnolia State .....	3	21	10	2	36
<b>MISSOURI</b>					
Central Missouri .....		16	4	1	21
Joplin .....		35	3	13	51
Kansas City .....	20	26	12	8	66
Pony Express .....		14	2	2	18
St. Louis .....		94	19		113
Springfield .....		40	1	5	46
<b>MONTANA</b>					
Midland Empire .....		34	8	9	51
North Montana .....		22	6	3	31
<b>NEBRASKA</b>					
Lincoln .....	1	20	3	2	26
Missouri Valley .....	4	20	4	1	29
<b>NEW HAMPSHIRE</b>					
Granite State .....		59	8	8	75
<b>NEW JERSEY</b>					
Garden State .....		100	10	21	131
Trenton .....	7	93	7	7	114
<b>NEW MEXICO</b>					
Duke City .....	1	29	3		33
<b>NEW YORK</b>					
Allegany Valley .....		22	1	4	27
Central New York .....		48	5	14	67
Hudson Mohawk .....		67	6	6	79
Metropolitan					
New York .....	4	153	20	7	184
Niagara Frontier .....	5	32	5	8	50
Rochester .....	9	66	6	9	90
Southern Tier .....		34	3	7	44
Westchester .....		26	5	1	32
<b>OHIO</b>					
Akron .....		84	8	13	105
Canton Regional .....		46	8	16	70
Cleveland .....	25	80	15	10	130
Columbus .....	9	109	14	10	133
Dayton .....	16	78	11	6	111
Lima .....		41	7		48
Medina .....		17	2	1	20
Scioto .....	1	33	6	4	44
Southern Ohio .....	2	13	1		16
Toledo .....	11	42	9	17	79
Youngstown .....	6	12	2	1	21
<b>OKLAHOMA</b>					
Oil Capital .....		28	16	10	54
<b>OREGON</b>					
Multnomah .....		27	1	3	31
<b>PENNSYLVANIA</b>					
Altoona .....		40		5	45
Central Penn-					
sylvania .....		65	13	20	98
Greensburg .....		43	7	1	51
Philadelphia .....		111	13	25	149
Pittsburgh .....	3	43	10	2	58
Reading .....		65	13	18	96
Scranton .....	9	17	2	5	33
Wyoming Valley .....	9	17	2		28
<b>RHODE ISLAND</b>					
Providence .....		76	3	9	88

88  
14  
112  
32  
182  
86  
54  
86  
73  
70  
6  
44  
14  
52  
25  
40  
160  
37  
36  
21  
51  
66  
18  
113  
46  
51  
31  
26  
29  
75  
131  
114  
33  
27  
67  
79  
184  
50  
90  
44  
32  
105  
70  
130  
133  
111  
48  
20  
44  
16  
79  
21  
54  
31  
45  
98  
51  
149  
58  
96  
33  
28  
88

ITS NYLON SEAT DISC . . . .

*Ends* YOUR SEATING TROUBLES

THE EASIEST AND  
SUREST SHUT-OFF  
MADE FOR REFRIG-  
ERATION USE.



THE *New*

MUELLER BRASS CO.

*Packless  
line valve...*

Molded nylon is the seat material  
for which the valve industry has been  
searching for years.

Molded nylon seat disc will stand up  
to regular charging board usage.

- The easiest shut-off in the field.
- Phosphor bronze and stainless steel diaphragms.
- Ports-in-Line.
- Large Hand Wheel.
- No Springs.

**MUELLER  
BRASS CO.**

PORT HURON, MICHIGAN

SERVICE ENGINEER

85

September, 1948

## Membership Count (Continued)

	A	B	C	D	E
<b>SOUTH CAROLINA</b>					
Charleston .....	39	5	2	46	
Greenville .....	20	4	7	31	
<b>TENNESSEE</b>					
Chickasaw .....	4	16	1	21	
<b>TEXAS</b>					
Corpus Christi .....	41	5	1	47	
Cow Town .....	7	33	14	54	
Houston .....	8	89	18	114	
San Antonio .....	68	3		71	
<b>UTAH</b>					
Beehive .....	42	5	9	56	
Utah Aggle .....	4	1	26	31	
<b>VIRGINIA</b>					
Blue Ridge .....	46	7	16	69	
Peninsula .....	31	4	17	52	
Tidewater .....	47	8		55	
Virginia .....	52	2	6	60	
<b>WASHINGTON</b>					
Seattle .....	7	31		43	
<b>WEST VIRGINIA</b>					
Charleston .....	2	17	4	23	
Tri State .....	11	1	5	17	
<b>WISCONSIN</b>					
Fox River Valley .....	32	3	10	45	
Green Bay .....	34	3		37	
LaCrosse .....	23	3	3	29	
Madison .....	5	25	2	32	
Milwaukee .....	7	49	11	74	
<b>CANADA</b>					
Border Cities .....	18	9	7	34	
Calgary .....	26	1	7	34	
Interprovincial .....	1	93	10	104	
Lions Gate .....	55	5	7	67	
Mt. Royal .....	82	21	3	106	
New Brunswick .....	3	32	9	44	
Nova Scotia .....	3	39	5	49	
Ontario Maple Leaf .....	9	115	33	167	
Vallee du St. Maurice .....		28	4	32	
Winnipeg .....		70	6	76	
Total .....	480	6562	1039	970	9052
Members-at-large .....	8	561	28	29	626
Grand Total .....	488	7123	1067	999	9678

\* \* \*

### Revision in Constitution and By Laws Proposed

IN ACCORDANCE with Article X, Section 1 of the Constitution (Amendments) and Article XIV, Section 1 of the By-Laws (Amendments), the Board of Directors at their meeting of January 24, 1948, adopted resolutions to submit to the membership for approval at the 11th Annual Convention, the following amendments to the Constitution and By-Laws:

#### Proposed Amendment to Constitution

Amend Article V, Section 1, (Chapters, State and Sectional Associations) to read as follows: This Association shall have power to grant charters to Chapters,

State and Sectional Associations. Charters to Chapters may be granted upon petition of ten or more eligible members in good standing *who shall qualify either as active or associate members, fifty per cent of whom shall be active members.* Charters to State Associations shall be granted upon petition of two or more Chapters within any state, each Chapter having ten or more members in good standing. Charters to Sectional Associations may be granted upon petition of two or more State or Provincial Associations or the majority of Chapters thereof. (Words in *italics* indicate proposed changes.)

#### Proposed Amendment to By-Laws

Amend Article V, Section 1 (Privileges of Members) to read as follows: At the annual and special meeting of the International Society, each chapter shall be allowed one voting delegate *who is a member of the chapter* and one vote for every member in good standing and upon whom the International per capita tax has been paid. Certificate, Active or Associate Members-at-Large are entitled to one vote each. No *Member-at-Large* shall be permitted to vote by proxy unless he shall give prior notice, accompanied with an affidavit showing his inability to attend, which notice shall be filed with the International Secretary on or before ten (10) days prior to any general or special election of officers or directors.

(Words in *italics* indicate proposed changes.)

—Signed—Cecil R. Visger,  
Chairman, Constitution and  
By-Laws Committee.

\* \* \*

#### RSSES Material Display

CECIL VISGER, Kansas City, international director of the Society, has prepared a 14 by 22 inch display board illustrating the various material available at a nominal cost to the membership.

Mr. Visger uses the display board when visiting chapters within his district or in conference with chapter officers. The board is covered with black sateen cloth; all items with the excep-



# VIRGINIA REFRIGERANTS

**"V-METH-L"**

Methyl Chloride

**"EXTRA  
DRY  
ESOTOO"**

Liquid Sulfur Dioxide

**consistently pure  
consistently sure**

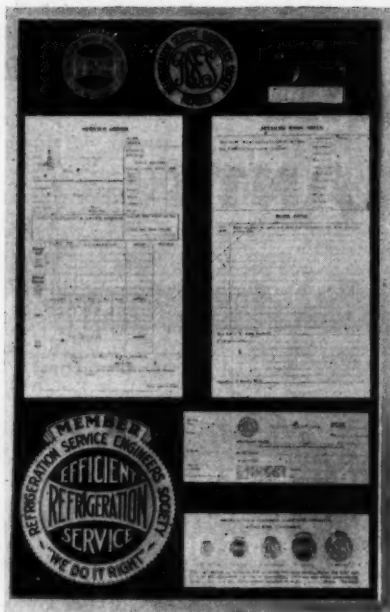


**VIRGINIA** *Refrigerants*

West Norfolk • New York • Boston • Detroit

**VIRGINIA SMELTING COMPANY, WEST NORFOLK, VA.**

*Distributors for Kinetic's "Freon" Refrigerants*



tion of the lapel button are fastened in place with library paste.

The frame is made of three quarter inch backband moulding with a glass cover to protect display from dirt and handling. Attached to the back of the display is a "V" shaped piece of plywood, 22 inches high, fastened with 2 one-inch brass hinges at the top, forming an easel for display purposes.

★ ★ ★

### Paul Reed Appointed Full-Time Educational Director of R.S.E.S.

FOR some time the Directors of the Refrigeration Service Engineers Society have been carrying forward a long-range plan to expand and intensify the services rendered by the Society to its members and to more effectively correlate its activities with other societies and associations in the refrigeration industry.

As another step in that plan, William J. Marshall, International President of the Refrigeration Service Engineers Society, announces the appointment, with the unanimous approval of the International Officers and Board of Directors, of Paul B. Reed as full-time Educational

Director of the society, effective as of September 1.

Mr. Reed's duties will consist in activating the educational program of the society by assisting chapters, state and regional associations of the society with their educational programs and by regularly distributing to all members, bulletins and articles on subjects of interest and value to the refrigeration service engineer. He will also be responsible for collecting and editing sections of the R.S.E.S. All Makes Service Manual now being compiled; by closely cooperating with the educational activities of other trade organizations; and by assisting the International Officers, particularly the International Secretary, H. T. McDermott, in the day-by-day routine work of the society.

Mr. Reed has been active for a number of years in the educational work of the Society, first as Chairman of the War-time Educational Committee, and for the last two years as Chairman of the International Educational and Examining Board.

### Has Broad Experience

Starting in 1919 as a service man for a Kelvinator dealer in Louisville, Kentucky, Mr. Reed worked on some of the earliest electric refrigeration equipment. Joining Servel in 1926 he was with that company in shop, engineering, and service work for 18 years, the last nine of which he served as Service Manager of the Electric Refrigeration and Air Conditioning Division. In 1943 he joined the Perfex Corporation as Manager of the Refrigeration Controls Division.

In addition to his R.S.E.S. activity, he is a past-chairman of the Milwaukee section of the American Society of Refrigerating Engineers, and has served on several A.S.R.E. national committees and has spoken before a number of A.S.R.E. sections.

He is also a member of the Engineering Society of Milwaukee, B.P.O.E. and American Legion, and is a Registered Professional Engineer of the State of Wisconsin. A number of his articles have been published in various trade periodicals. Two of his books on refrigeration have been published and three more are to be published within the next few months.

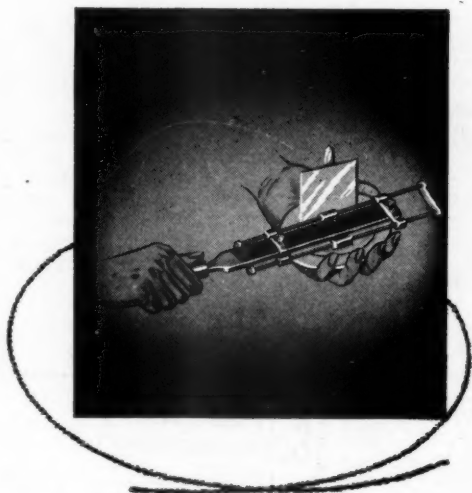
Meets The Rigid Requirements Of Discriminating Mechanics.



## FLOAT RESEATING TOOL

(FOR FRIGIDAIRE LOWSIDE FLOAT)

A PERFECT NEW SURFACE  
IN **1** MINUTE!



No lathe—no drill press—not even a vise is required. The Watsco Float Reseating Tool—a "complete shop" in the field—to accurately resurface the needle seat on any Frigidaire lowside float. Can be operated even by an unskilled worker. Consists of a mill file clamped in a frame which slides back and forth in a bed. Cast in the bed is a sleeve which is drilled and finished with inside diameter exactly the size of the Frigidaire float needle seat.

**\$750**

including file and  
**DIRECTIONS FOR  
FLOAT  
REALIBRATION**

Some of our other products are:

Our latest **CHECK VALVES (NoC3)** designed for Cold Spot and Bohn unit installations are money and time savers.

**WATSCO Replacement Terminals** for sealed units, cuts your labor time to 5 minutes instead of the usual 6 to 7 hours.

Flappers for sealed units.  
Vaness for Norge Rollator and Cold Spot open and sealed units. Bearings, Tools, etc.

Speed repairs and cut your costs with **WATSCO** products. Sold by leading wholesalers everywhere.

Write for Our Free Descriptive Circular.

**W**agner

**TOOL AND SUPPLY CORP.**

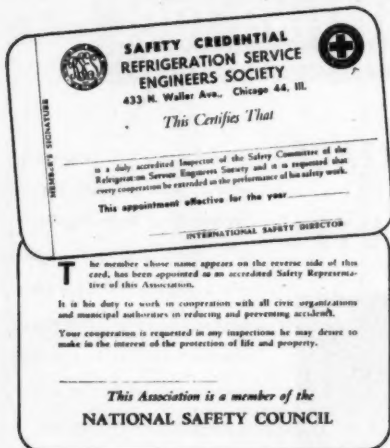
**1300 43rd AVENUE • DEPT. RF, • LONG ISLAND CITY 1, N.Y.**

SERVICE ENGINEER

89

September, 1948

## Identification Cards for Safety Chairmen



AN IDENTIFICATION card for the safety chairman of local chapters is now being issued by International Safety Director George Schuld, Sr., 12201 Revere Avenue, Cleveland 5, Ohio, as

part of the program to emphasize the safety program undertaken by the committee.

The safety committee recently addressed a questionnaire to each chapter to ascertain the names of local safety chairman. Each chairman indicated on the returned questionnaire will receive his safety credential card direct from Chairman Schuld. Chapters should return the questionnaire promptly so that their representative may secure the "safety credential card."

## J. J. Croushore Returns to Columbus

J. J. CROUSHORE, formerly in the service department of Universal Cooler Co., Marion, Ohio, recently resigned to return to Columbus, Ohio. Mr. Croushore, prior to his entry into service during the war, was associated with the American Sales Co. at Columbus, refrigeration equipment dealer. He returns to this company as service manager. He has been active in R.S.E.S. affairs and is at present serving as educational director of the Buckeye (Ohio) State Association.

## SAFETY HAS NO SUBSTITUTE



Never hang a lighted torch on top of a Prest-O-Lite "B" tank. Heat may blow fuseable plug and cause fire.



Never store a charged condensing unit in a basement. In case of fire the unit may explode.



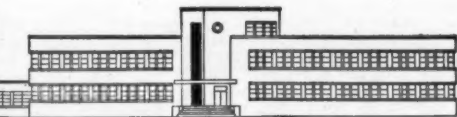
**new!**

Get the facts now, about this entirely new line of motor starters. Compact, easy-to-install, sturdily constructed for long life and dependability.

Built in sizes 0, 1 and 1½. Available with Type 1 enclosures or as open-type models for control panels. Overload relays easily adjustable for automatic or manual reset. Write now for Bulletin 2705 to Penn Electric Switch Co., Goshen, Indiana. Export Division: 13 East 40th Street, New York 16. In Canada: Penn Controls Ltd., Toronto, Ontario.

*Send*  
**FOR THIS  
BULLETIN**  
*to*

**PENN**



**AUTOMATIC CONTROLS**

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

## Taft Service Manager at Universal

**D**ONALD TAFT, a member of the board of directors of Scioto Chapter, R.S.E.S., Marion, Ohio, has recently been appointed service manager of Universal Cooler Co., Marion, Ohio. Mr. Taft who has been in the service department replaces Karl Weber, recently resigned.

★ ★ ★

## CHAPTER NOTES

• **ALTOONA CHAPTER, Altoona, Pa., June 2**—Quite a lengthy discussion was held concerning a picnic to be held in the future. A Publicity Committee consisting of W. B. Fields, Joseph Olkowski and T. J. Kibler was appointed by President Bender in the course of the business meeting. It was also decided that the chapter should purchase a complete set of cuts and emblems for imprinting letterheads, envelopes, business cards, etc., and retained in the possession of the Secretary for loan to all members. Refreshments were enjoyed after adjournment.

• **ARROWHEAD CHAPTER, Riverside, Calif., Aug. 9**—Thirty members and four guests attended this meeting. Mr. Heath of the San Bernardino Valley College was called upon to tell the chapter his needs for competent refrigeration men to act as part-time instructors in the fall term. The meeting was then turned over to Educational Director Frazier who introduced Charles Chidester of the C & H Equipment Co. Mr. Chidester gave an illustrated lecture on the proper use of driers in wet systems, showing the construction of Remco drier-filters. At the close of the meeting, tickets were sold on a new style tube cutter, donated by Chas. Olbright of Valley Refrigeration, and a layer cake brought by C. Edwards. The cake Mr. Edwards brought, incidentally, was his penalty for having drawn his own number twice at a Long Beach Chapter meeting, thus winning a choice three layer cake.

• **AZALEA CITY CHAPTER, Mobile, Ala., Aug. 18**—The business session was delayed for the program arranged by the Educational Committee. Harry G. Duke, representing Bussman Mfg. Co. of St. Louis, presented a very interesting demonstration of motor and motor circuit protective devices. Mr. Duke illustrated his talk with slides and a special demonstration unit consisting of a three phase and single phase motor equipped with a device to vary the motor load. This unit was also equipped with an ammeter connected in series with the motor and receptacles for fusestrons. The demonstration unit was very complete and served to illustrate in detail the importance of adequate motor and motor circuit protection, and Mr. Duke

did an excellent job in presenting it. Chapter members highly recommended that other chapters secure this demonstration for their educational program. The regular business meeting followed, during which time a number of visitors were introduced.

• **BIRMINGHAM CHAPTER, Birmingham, Ala., July 7**—A suggestion was made that the chapter's educational committee be enlarged and an educational campaign inaugurated so that all members might have an opportunity to qualify themselves for certificate membership. This led to a general discussion of the need for information by all. It was the consensus of opinion that although no member could possibly have all the answers to all problems, some member could furnish the answer to almost any problem or question if it was presented to the group, therefore it was decided to call on members for formal discussions of their individual specialties, with a general discussion to follow each talk. Application of L. E. Billeter for active membership was unanimously accepted. Twenty-two members were in attendance.

### Here's the Reason

If you miss any of the membership services of the R.S.E.S. it may be that your name has been removed from the list because your dues are unpaid for the current 1948-49 fiscal year.

In accordance with the constitution and by-laws, members names are removed from the mailing list on September 1 if current dues are not paid. Make sure you are not in arrears.

### Pay Your Dues Now

• **BLACKHAWK CHAPTER, Burlington, Iowa, Aug. 2**—The speaker scheduled for this meeting was unable to appear so instead an open discussion was held by the members. It was announced that the Pioneer Supply Company will contribute tools to be awarded to the best suggestions turned in by members every three months.

• **CHARLESTON, S. C. CHAPTER, Charleston, S. C., Aug. 4**—The first order of business was the election of the board of directors. They are: J. E. Corvette, T. A. McKenzie, T. M. Gaskins, W. R. Chassereau, J. A. Clarke, C. H. Pinckney and F. A. Bailey, Jr. T. E. Corvette accepted the chairmanship of the Refreshments Committee and C. H. Pinckney was appointed chairman of the Investigating Committee. The educational program was an interesting movie on the servicing of water cooled condensers, presented by Mr. Moody. Refreshments were served.



**REMCO** INCORPORATED  
MAKERS OF "Cross-Flo" DRIER-FILTERS

PROUDLY INTRODUCE

THEIR NEW

# **E-Z-SEE** LEAKPROOF LIQUID INDICATOR

THE 100% ANSWER TO THE INDUSTRY'S  
DEMAND FOR A FOOLPROOF  
LIQUID INDICATOR . . .

- E-Z TO SEE THROUGH
- POSITIVELY LEAKPROOF
- PERFECTLY SAFE TO USE

IT'S E-Z TO SEE THROUGH the tubular high pressure Pyrex gauge glass. Magnifies when filled with liquid to afford far better than normal vision.

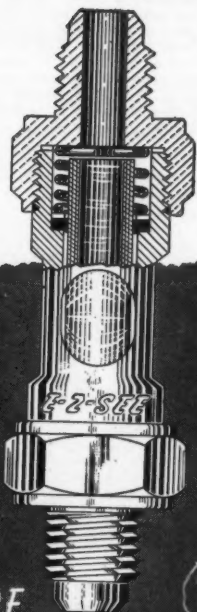
CAN'T LEAK BECAUSE the springs maintain just the right amount of force upon the neoprene gaskets, form a positive seal around the glass to compensate for "cold flowing." Refrigerant pressure on gaskets assists springs to make an even tighter seal. The higher the pressure, the tighter the seal.

SAFE BECAUSE glass is protected by unique slotting arrangement in the rugged brass body. Glass actually "floats" in spring compensated neoprene gaskets thus withstands pressures up to 500 P.S.I. with perfect safety.

SIZES— $\frac{1}{4}$ ",  $\frac{3}{8}$ ", and  $\frac{1}{2}$ ", male  
flare x male flare and female flare  
x male flare. Literature and prices  
available upon request.

Sold by Leading Wholesalers Everywhere

**REMCO**  
INCORPORATED  
ZELIENOPLE, PENNSYLVANIA



● **FLORIDA WEST COAST CHAPTER, Tampa, Fla., July 8**—A letter from the International Office regarding recorded lectures was read and after a discussion a motion was made and seconded that the chapter secure these lectures. The educational chairman gave a report on the progress he was making in getting a new educational program started. This was followed by a talk on superheat and its function, in which all took part.

● **FORT WAYNE CHAPTER, Fort Wayne, Ind., Aug. 23**—The 31 members and guests present enjoyed a sound film entitled "Of This We Are Proud," presented by Mr. Ferguson of the Kelvinator Corporation. The picture dealt with the history, development and progress of industry in the United States.

● **FOX RIVER VALLEY CHAPTER, Fond du Lac, Wis., July 7**—New officers installed at this meeting were Ardon Abraham, President; Marvin Sommerville, Vice-President; Alfred Wright, Secretary; Wm. Quinn, Jr., Treasurer; and Marvin Belter, Sergeant-at-Arms. George Wilson, manufacturers' agent for the Airserco Company and the Ultra Violet Products, Inc., gave an interesting talk and demonstration on their products. He also showed two educational movies on motor trouble and controls. Refreshments were served.

● **GOLDEN GATE CHAPTER, San Francisco, Calif., July 27**—The meeting opened with the installation of the newly elected officers. On

● **GREENSBURG CHAPTER, Greensburg, Pa., Aug. 2**—Election of officers was held resulting in the following: P. A. Nutter, President; H. C. Miller, 1st Vice-President; Charles Dove, 2nd Vice-President; A. L. Milazzo, Secretary; D. P. Miller, Treasurer; Frank Mantell, Sergeant-at-Arms; and J. C. Hipps, Educational Chairman. Board of Directors—Sam E. Hodge, Paul Brandstetter, Andrew A. Hudak and H. I. Elsmar.

● **GREENVILLE CHAPTER, Greenville, S. C., Aug. 11**—During the business meeting, H. L. Price was elected chairman of the Membership Committee. Further discussion was held concerning the issuing of customer return cards. Due to the small attendance there was no educational program.

● **HUB CHAPTER, Compton, Calif., Aug. 26**—The following officers were installed by J. Pat Riley, Jr., past president of the CARSES: R. F. Chambers, President; N. J. Parent, Vice-President; E. F. Brown, Secretary-Treasurer; R. Bailey, Sergeant-at-Arms; and M. I. Francis, Educational Chairman. The new president announced that he had some big plans for the chapter for the coming year and that a membership drive would start immediately. Visitors introduced were T. Langwell, President of Long Beach Chapter and C. Ostrander, Secretary of Long Beach, C. D. Bingham of Hollydale and A. Moore of Bellflower.

● **KANKAKEE VALLEY CHAPTER, Kankakee, Ill., Aug. 3**—Bill Stearns was appointed delegate and Wilbur Olroyd appointed alternate to represent the chapter at the State Convention. The educational program for the evening included slides and records on reverse cycle refrigeration, and also a picture on a modern locker plant.

● **LITTLE EGYPT CHAPTER, Benton, Ill., Aug. 4**—Two new members, Roy W. Patts of Eldorado, Ill., and Hugh Sanders of Sandoral, Ill., were accepted into the chapter. The meeting was turned over to Mr. Reece who introduced Mr. Mohler of the R. E. Thompson Co., who in turn introduced the speaker of the evening, H. T. Spoehrer of Sporlan Valve Co. Mr. Spoehrer gave an educational talk on thermostatic valves using slides to bring out the fine points. There were 25 members and 10 guests present, including J. T. Barry of Sporlan Valve, Martin Lingle of Kansas City, Mo., and Messrs. Lewis and Mitchell from Kelvinator Sales in St. Louis. Refreshments were furnished by the sponsor, The R. E. Thompson Co., St. Louis, Mo.

● **LONG BEACH CHAPTER, Long Beach, Calif., Aug. 9**—Attendance totaled 18 visitors, 5 candidates and 34 members. The first 45 minutes of the meeting were devoted to the monthly educational round-table discussion by Arbitrator Roy Willis, assisted by Harold Phillips and Henry Howard. The business meeting followed and the visitors were introduced. After all reports were heard, the meeting was turned over to Past State Educational Director Merle Soden of Orange County Chapter, who gave a very educational and interesting talk on "Freon-22." A raffle was held with prizes going to Demi Voorris, Bill Jay, Al Eisenbeiss, Jim Scholler and Lyle Evans. Refreshments were served.



The Golden Gate Chapter picnic held July 10, provided a very pleasant outing for members, their families and friends. Eats were plentiful and well patronized as indicated in the above views.

behalf of the members, Mosby B. Willis presented a billfold to retiring president C. Rusten. A membership drive is being held by the chapter with a prize of \$10.00 to the member with the most applications and dues by September 14. The meeting adjourned to the banquet room for coffee, ice cream and cake donated by Mrs. G. Lindell.

# Simpson "Micro-Tester" Portables

... for all appliance testing

## Models 391 and 392 A.C.-D.C. Volt-Wattmeter

These pocket-sized instruments, designed for simultaneous reading of volts and watts, provide servicemen with the most convenient and durable appliance testers ever made.

Each instrument consists of two separate, full-size, 3" square meters—one for volts and one for watts. Readings, therefore, are quick and exceptionally accurate. A built-in cord and plug for connecting to line outlet and a female receptacle for connecting the appliance under test are additional examples of typical Simpson construction.

Low power consumption and high efficiency of the instruments result in negligible loss and error in reading.



Leatherette carrying case \$3.00

### MODEL 391

Ranges, A.C. or D.C.

Volts: 0-130, 0-260

Watts: 0-1500, 0-3000

Size: 3" x 5 7/8" x 2 1/2"

Wt.: 2 lbs. Shipping Wt.: 3 lbs.

Dealer's Net Price .....\$30.00

### MODEL 392

Ranges, A.C. or D.C.

Volts: 0-130, 0-260

Watts: 0-1000, 0-3000

Size: 3" x 5 7/8" x 2 1/2"

Wt.: 2 lbs. Shipping Wt.: 3 lbs.

Dealer's Net Price .....\$35.00

### Model 390 Volt-Amp-Wattmeter . . .

The first tester ever to offer volt, ampere, and wattage readings in one hand-size instrument. Provides two ranges each of voltage and current, and four wattage ranges, covering practically all types of appliances.

When model 390 and appliance are plugged into Break-In plug furnished, voltage reads immediately. Panel buttons provide ampere or wattage readings. Instrument may also be used as an individual voltmeter or ammeter. Accuracy is 5% of full scale reading.

Ranges: A.C., 60 cycle

Volts: 0-150, 0-300

Watts: 0-300, 0-600, 0-1500, 0-3000

Amperes: 0-3, 0-15

Size: 2" x 5 7/8" x 2 1/2"

Wt.: 1 1/2 lbs.

Shipping Wt.: 2 1/2 lbs.

Price, with Break-In plug

and leads .....\$39.50

Leatherette covered carrying case .....\$ 5.00



# Simpson

SIMPSON ELECTRIC COMPANY  
5200-18 West Kinzie Street, Chicago 44, Ill.  
In Canada: Bach-Simpson, Ltd., London, Ontario.

● **MAGNOLIA STATE CHAPTER, Jackson, Miss., August**—Officers for the 1948-49 term are: Charles Bowron, **President**; George Martz, **Vice-President**; Luther Williford, **Secretary-Treasurer**; A. E. Shafer, **Educational Director**; and C. Gardner, **Publicity Director**.

● **MIAMI CHAPTER, Miami, Fla., August**—A membership contest is in progress with two sides participating. The losing side will furnish refreshments for the winners. Mr. Brown outlined the progress made with city officials and others regarding the pending ordinance. The educational portion of the meeting was a questions and answers period, followed by a movie, conducted by Mr. Dolar.



Views of the Miami Chapter tube bending contest sponsored by the Imperial Brass Mfg. Co. in June of this year. The upper photo is a general view of the contest. In the lower photo J. Turpin, 1st prize winner, is receiving his prize from Frank McNellis, Imperial representative. Other prize winners looking on are P. E. Richie, A. Vann and T. Thomson.

● **NOVA SCOTIA CHAPTER, Halifax, N. S., July 17**—L. Foster, E. A. Howitt and R. P. Martell were raised to certificate membership. Some time was spent talking about safety, and John Roberts, who incidentally flew from Glace Bay to attend the meeting, told of some bad mistakes he knew and had heard of. L. Foster and C. Tredwell were appointed the Safety Committee. A committee was appointed to arrange for the joint meeting with the New Brunswick Chapter.

● **SOUTHWESTERN MICHIGAN CHAPTER, Kalamazoo, Mich., August**—New officers for this chapter are Larry Puerner, **President**; Lawrence Palmer, **Vice-President**; Arthur E. Austin, **Secretary**; and Ira D. Briggs, **Treasurer**.

● **SUNSHINE CITY CHAPTER, St. Petersburg, Fla., July 8**—During the business meeting C. W. Killinan was accepted into the chapter as Junior member. The balance of the time was spent in discussing and deciding upon various matters pertaining to the chapter.

● **WHALING CITY CHAPTER, New Bedford, Mass., June 17**—Attendance at this meeting totaled 36. New applications were approved for Allen C. Currie, Malcolm Tripp and Russell J. St. Jean. Educational motion pictures were shown after the business meeting. Door prizes were donated by the Supply Distributors Corp. of Boston, and won by the following: Richard Evans—Mini-volt tester; Edward Martin—Bonney ratchet wrench. Donuts and coffee were served after the meeting.

● **WOLVERINE CHAPTER, Lansing, Mich., July 12**—The following were elected at this meeting to serve for the coming fiscal year: Sidney Ferrin, **President**; Clare McNaughton, **Vice-President**; Oral C. Harris, **Secretary**; Willard K. Baker, **Treasurer**; and Carl Kubler, **Sergeant-at-Arms**.

● **YOSEMITE CHAPTER, Modesto, Calif., July 21**—Preparations were made at this meeting for the chapter's charter presentation. The educational program consisted of an interesting talk on Btu's, given by Mr. Brundage.

## Ladies Auxiliary

● **DAYTON AUXILIARY, Dayton, Ohio, July 22**—The meeting was held at the Miami Valley Distributing Co., and during the business session arrangements were made to secure a speaker to give a talk on the processing, storing and preparing of frozen foods at a future meeting. A dinner and theater party was also discussed. Mrs. Margaret Hopper was accepted as a new member.

● **GOLDEN GATE AUXILIARY, San Francisco, Calif., July 27**—This was the first meeting held by this auxiliary and the following were elected to office: Mrs. Dolores Larsen, **President**; Mrs. Kitty Frazier, **Vice-President**; Mrs. Pauline Lindell, **Secretary**; Mrs. Sarah Sullivan, **Treasurer**; Mrs. Dorothy Engler, **Sergeant-at-Arms**. Directors—Mrs. Ethel Atwood, Mrs. Katherine McDermott and Mrs. Alice Fistolera. Social events were discussed for the coming year, as well as a general business session concerning increasing the membership and various methods to be used to raise funds for the treasury. A very pleasant social period followed, the ladies being joined by their husbands in refreshments of homemade cake, ice cream, coffee and cold drinks.

● **ROCHESTER AUXILIARY, Rochester, N.Y., June 9**—A dinner preceded this meeting, which was the last to be held until September. It was decided to change the auxiliary meeting place to Beechwood Hall when activities are resumed in the fall. A vote of thanks was extended to Alice Stevenson and Ann Fien for the splendid job they did on the entertainment committee for the dinner.

# The Refrigeration Contractor's ESTIMATING GUIDE

by DONALD F. DALY

**T**HE author presents in this new book results of not only his own experience, covering many years of refrigeration estimating, but the knowledge of other substantial refrigeration contractors who have learned the "hard way." The purpose of this book is to bring to you, in concise form, this wealth of experience.

Remember there is no magic formulae or short cuts for estimating refrigeration installations but there are plenty of pitfalls that the experienced and inexperienced estimator can avoid.

This book points out, step by step, the approach to the problem confronting every individual and organization engaged in the business. It presents in readable form and understandable language, information that oftentimes means the difference between profit and loss.

*The principal subjects include discussions on:*

ESTIMATING INSTALLATION COSTS  
ESTIMATING REBUILD OR OVERHAUL JOBS  
CONTRACTING FOR DEALER SERVICE  
REBUILDING PACKAGED UNITS ON CONTRACT  
COMMERCIAL MONTHLY INSPECTION CONTRACTS  
COMMERCIAL MONTHLY LABOR AND MATERIAL CONTRACTS  
SERVICING EQUIPMENT FOR LOW COST OPERATION  
WARRANTY SERVICE  
REFERENCE TABLES

*This book is principally a compilation of articles appearing in past issues of The Refrigeration Service Engineer*

**138 pages—6 x 8½ inches—\$2.00 postpaid**

USE THIS ORDER

Nickerson & Collins Co.  
433 N. Waller Ave., Chicago 44, Illinois

Enclosed is remittance for \$2.00. Please send "THE REFRIGERATION CONTRACTOR'S ESTIMATING GUIDE."

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

THE REFRIGERATION SERVICE ENGINEER  
REFERENCE MANUAL No. 4

\$2.00



# “ NEWS OF THE ” EQUIPMENT INDUSTRY



## Series of Control Meetings on West Coast Completed by Penn Electric Switch Co.

A SERIES of 18 educational meetings on automatic controls with refrigeration and heating service engineers was recently completed by R. H. Luscombe, general sales manager, of Penn Electric Switch Co., Goshen, Indiana. Meetings were devoted to practical information on the use, construction, selection, installation and servicing of automatic controls.

Use of giant cutaway models with moving parts, colored slides and a "live" demonstration board illustrating the functioning of a complete refrigeration system enlivened the interesting presentation and simplified what is generally conceded to be a complicated subject. The "live" refrigeration board climaxed the meeting by visually illustrating the function and operation of each part of the refrigeration system. Diagrammed on a large board, the system incorporated different colored lights to show the action of its function.

At the close of each meeting, a ques-

tion and answer session was held for the benefit of the audience to answer their individual questions on application problems. Meetings in each city were sponsored by local wholesalers of Penn controls.

The west coast meetings were held in Spokane, Seattle, Portland, Sacramento, San Francisco, Fresno, Los Angeles, San Diego, Salt Lake City and Denver. This series of meetings proved so popular and helpful that Penn Electric Switch Co. is now planning to schedule similar meetings in other sections of the country. These meetings will be announced as soon as arrangements can be made.

★ ★ ★

## Baker Ice Machine Granted License Under Water Defrost Patent

A LICENSE agreement between "Re-cold" and Baker Ice Machine Co., Inc. of South Windham, Maine and the Northwest Baker Ice Machine Co., Inc. of Seattle, Washington has just been consummated, according to a statement just made by Hy Jarvis, vice president and general manager of Refrigeration Engineering, Inc. of Los Angeles, California,



Refrigeration service men, dealers, wholesalers and manufacturers in attendance at the Penn meeting in Los Angeles, Calif.



HOWE REFRIGERATION KNOWN THE WORLD OVER

## HOWE-TO HAVE TROUBLE FREE REFRIGERATION!

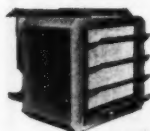
"I've never seen any machine that operated so trouble-free." Here's proof . . .

from a user . . . of an important advantage

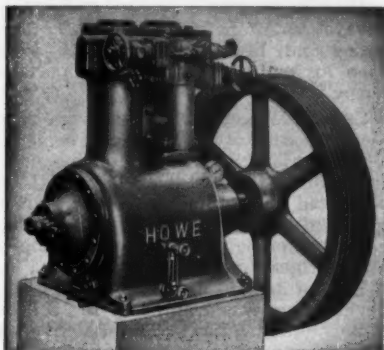
Howe Refrigeration Equipment offers.

Trouble-free operation cuts risk of food spoilage. Saves money . . . time. Let

Howe's 36 years of specialization solve your refrigeration problems with equipment *basically* right. Howe machines *give less trouble . . . keep running longer*. They're *designed* to do that. Inquiries invited.



Howe-Conditionaire Unit Cooler



*Ammonia compressors 2 to 150 tons; self-contained automatic ammonia units; methyl and Freon condensing units; shell and tube condensers; brine and water coolers; unit coolers; fin coils; locker freezing units; air conditioning (cooling) equipment.*

## HOWE ICE MACHINE CO.

2825 Montrose Ave., Chicago 18, Illinois • Distributors in all Principal Cities  
EXCLUSIVE REFRIGERATION EQUIPMENT BUILDERS SINCE 1912

### New Second Edition HOUSEHOLD ELECTRIC REFRIGERATION

By John F. Wostrel and John G. Praetz  
Second edition, 472 pages, 20 illustrations,  
\$4.50

Presents everything needed by the man who wishes to service electric refrigerators, from a simple explanation of how refrigerators work, to detailed practical methods and data on installation, testing, servicing, and adjusting, trouble-shooting, repairing, etc. It gives descriptions and illustrations of many popular makes of machines, showing both the entire systems and details of parts. It emphasizes the basic points of construction and operation so that the reader can handle practically any type of machine.

Order copies from:

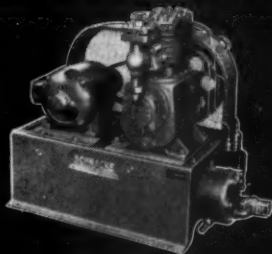
**Nickerson & Collins Co.,**

433 N. Waller Ave.  
SERVICE ENGINEER

Chicago 44

SERVICE ENGINEER

### SCHNACKE COMPRESSORS and *Complete* CONDENSING UNITS



THE INDUSTRY'S MOST  
*Easily* SERVICED UNITS

For detailed Service  
and Engineering data, write

**SCHNACKE, INC.**

1024 Columbia Street EVANSVILLE, IND.

holders of the patent covering water defrost coils.

The Baker Ice Machine Co., Inc. is one of the oldest and best known companies in the refrigeration business. They have always maintained a very progressive policy and, because of this fact, have been for many years a very important factor in the field.

Under the license agreement, which is identical with other license agreements already granted to nine other manufacturers in the United States, Baker will be permitted to manufacture water defrost coils under their own name.

The water defrost coil was developed by Refrigeration Engineering, Inc., in 1938, and in 1940 a patent covering the development was granted by the United States Patent Office. This patent was recently upheld by the United States Circuit Court of Appeals for the Ninth District.

★ ★ ★

#### **N.A.R.C. To Meet in Chicago**

The Board of Directors of the National Association of Refrigeration Contractors met in Chicago on September 10th. The purpose of the meeting was to discuss plans and arrangements for the annual meeting to be held in the Hotel Sherman on November 18th and 19th.

N.A.R.C., in selecting the dates of November 18th and 19th were cognizant that R.S.E.S. is holding their annual meeting at the same hotel on November 19, 20, 21 and 22. It was felt that many members of N.A.R.C., likewise being members of R.S.E.S., that it would be a convenient means for these members to attend both sessions.

#### **N.A.R.C. To Assist Member Sales**

N.A.R.C., in endeavoring to assist its members in the broad field of sales and merchandising, has approached through correspondence many of the major manufacturers of refrigeration equipment asking that their General Sales Manager contribute articles of

interest that will be of material benefit to the contractor.

So far, N.A.R.C. reports that they have had exceptional results and that from time to time in the future through their semi-monthly bulletin, manufacturers will give their viewpoints on how to best sell, service, advertise, and merchandise products.

N.A.R.C. likewise is developing this same program among its own members, encouraging them to send their ideas and suggestions based on experiences, which N.A.R.C. feels will be of definite value to all members in this exchange of ideas.

N.A.R.C. likewise invites all criticisms and suggestions and articles which members and non-members feel will be a contribution to the betterment of the industry.

★ ★ ★

#### **Airo to Handle Universal Cooler Line of Units**

AIRO Supply Co., refrigeration equipment wholesalers located at 2732 North Ashland Ave., Chicago 14, Ill., have been granted a franchise from Universal Cooler Div. of the International Detrola Corp. to stock and sell their complete line of hermetic units.

Airo will stock the complete line of hermetic units from 1/4 to 1/2 hp. and the full line of open type air cooled and water cooled units from 3/4 to 15 hp. In addition they will maintain a complete stock of repair parts for all Universal Cooler units.

★ ★ ★

#### **Thermal to Open Branch**

THERMAL COMPANY, INC. expects to open a new branch at Sioux Falls, South Dakota, in September. It will be located in a new building at 119 North Fairfax Avenue near the corner of 8th Street and Fairfax, where ample show room, office and stockroom space is provided.

Complete stocks of refrigeration and air conditioning supplies and equipment will be maintained for distribution on a wholesale basis throughout the Sioux Falls trading area. Heating equipment and accessories will be handled on the same basis. The branch will be in charge of Robert Smith, who has been the South Dakota field representative of the firm. In addition to the new branch the Ther-

## 1 MAN NOW DOES THE WORK OF 2



SAVE 50 to 60% of your hauling costs with the Easload Appliance Truck.

This scientifically balanced truck carries full weight of load on 10" cushion tires. Patented balancing mechanism causes wheels to slide forward for loading—backward, at touch of foot pedal—for free easy rolling. Tubular smooth steel handles for sliding load. All-welded frame. Twin strap ratchets. Appliances fully protected... 11 BIG FEATURES to cut down man-hours and work.

*For Refrigerators, Ranges,  
Heaters, Radios  
\$48.50 f.o.b. Los Angeles  
Immediate Delivery*

**COLSON**  
EQUIPMENT & SUPPLY CO.  
1317 WILLOW STREET  
LOS ANGELES 13, CAL.

SERVICE ENGINEER

MOTOR-CAPACITOR  
NEEDS can be

**JEFFY**  
**CHECKED**  
with this

**SELECTOR**



• Clip in place of wornout capacitor. Flip switches until quickest start, within safe voltage reading, is obtained. Read capacitance value directly. Saves time, trouble, money, headaches! Available from your Aerovox supplier. Or write us.



**INDUSTRIAL APPLICATIONS**

AEROVOX CORP., NEW BEDFORD, MASS., U.S.A.  
Export: 13 E. 40th St., New York 16, N.Y. Cable: "ARLAB"  
In Canada: AEROVOX CANADA LTD., Hamilton, Ont.

mal Company, Inc., with headquarters at St. Paul, Minn., also operate branches at Milwaukee, Wisconsin, Great Falls, Montana, Cedar Rapids, Iowa, and Des Moines, Iowa.

★ ★ ★

### **Portable Cargo Reefers Solve Transport Problem**

**R**ECO Products Division of Refrigeration Engineering Corporation "came, saw and conquered" a problem involving rush transportation of frozen food-stuffs to an exploration crew of a prominent oil company in the Persian Gulf area, recently.

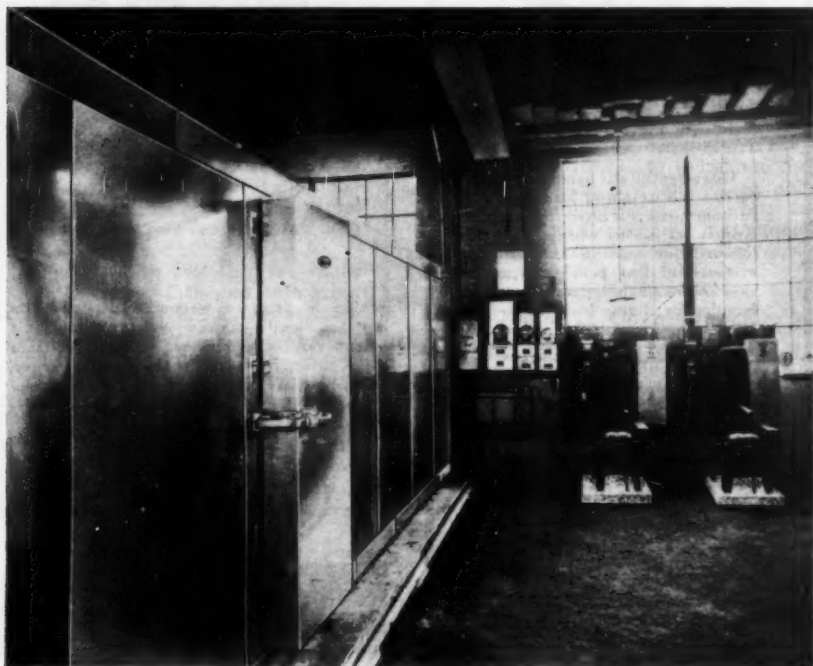
When advised on Tuesday that a chartered liberty ship was to sail for the Persian Gulf on the following Saturday, which would have to carry frozen foods to their exploration crew, all concerned put their heads together to develop a "jury rigged" but entirely seaworthy expedient, to provide zero

degrees F. "Reefer" cargo space for this urgent requirement.

In conjunction with a Baltimore refrigerator contractor, a model 120-5 Reco - Fab, pre-fabricated, sectional cooler, measuring 12'1"x19'3"x7'6" high was erected on the number 3 hatch of the liberty vessel. The vessel, which was of Canadian design, has the number 3 hatch located between two super-structures, thus affording fairly good protection for the installation.

After the freeze cooler was erected, it was rigidly blocked in place, and further braced through use of sling wires placed about the top and the base of the "pre-fabricated reefer." These were made fast to various pad eyes. The freeze cooler was then protected from excessive sun rays by means of an awning slung between the two super-structures.

The "so-called" reefer was refrigerated by means of two 3 hp. air cooled, Carrier, Navy surplus units which were



One of the welded steel portable reefers being made by Reco Products for use in shipping perishables.

this  
re-  
20-5  
ional  
high  
h of  
which  
um-  
per-  
good  
ected,  
fur-  
vires  
e of  
were  
The  
from  
own-  
ruc-  
ger-  
oled,  
were  
ping  
ION

**the LIQUID EYE**

a NEW type of liquid indicator

2 new models

MALE-FEMALE

**SAFE . . . LEAK-PROOF . . . EASY TO INSTALL . . .**

### Fully enclosed GASKET

The pliable gasket is enclosed on three sides by a brass housing, prevents the gasket from creeping.

### Lapped GLASS

Lapped glass surface makes a fourth side to fully enclose the gasket making a perfect seal. See inset above.

Ask to See the LIQUID EYE at Your Jobber

PERMANENT COPPER FLARE INSERT simplifies direct installation on dryers or receivers. Eliminates use of extra flare nuts thus fewer connections are necessary.

DOUBLE PORT  
ELIMINATES PRESSURE DROP  
POSITIVE REACTION OF INDICATOR  
FLOATING PYREX TUBING INSURES SAFETY  
PLIABLE GASKETS, IMPERVIOUS TO  
REFRIGERANTS AND OIL

**ALLIN MANUFACTURING COMPANY • 1153 W GRAND AVE • CHICAGO ILL**

## STERILAIRE\*

### THE Ultra Violet GERMICIDAL LAMP

for use only in refrigerated areas

STERILAIRE\* brings to the refrigeration industry new opportunities for service and profitable sales. Refrigeration dealers sell STERILAIRE with new walk-in boxes. Service men sell STERILAIRE to their regular customers.

These Wholesalers merchandise STERILAIRE. Ask them for details

#### ARKANSAS

Refrigeration & Electric Supply Co.

#### CALIFORNIA

Associated Refrigeration & Equipment Co.  
Authorized Supply Corp.  
Rauch & Monroe  
Refrigeration & Industrial Supply Co.  
Refrigeration Service, Inc.  
Refrigeration Supplies Distributor  
Valley Refrigeration Supply Co.  
Van's Supply

#### COLORADO

Western Appliance Corp.

#### FLORIDA

Ace Refrigeration Supplies

#### ILLINOIS

Chase Refrigeration Supply  
Service Parts Co.

#### MINNESOTA

Refrigeration & Industrial Supply Co., Inc.

#### MISSOURI

N. O. Nelson Co.  
Superior Refrigeration Supply

#### MONTANA

Refrigeration Supply Co.

#### NEW JERSEY

W. I. Freeman & Co., Inc.

#### NEW YORK

County Seat Supply Co., Inc.  
Halsey Supply Co.

#### OHIO

Radio & Refrigeration Supply Co.  
Ultra-Violet Equipment Co.

#### OKLAHOMA

K & M Supply Co.  
M & V Supply Co.  
Mackinburg Supply Company, Inc.

#### OREGON

Peerless Pacific Company

#### PENNSYLVANIA

Joyce Refrigeration & Equipment Co

#### TEXAS

N. O. Nelson Co.  
Texas Refrigeration Supply Co.  
United Refrigeration Company

#### WASHINGTON

Peerless Pacific Co.  
Refrigeration Wholesalers, Inc.

#### WISCONSIN

Gustave A. Larson Co.

**ULTRA-VIOLET PRODUCTS, INC.**

\*Trade mark reg. U.S. Pat. Off.

5205 Santa Monica Blvd.  
LOS ANGELES 27, CALIF.  
EXPORT: Fraser & Hansen, Ltd. San Francisco

SERVICE ENGINEER

103

September, 1948



converted for operation on 115 d.c. current, through use of marine type d.c. motors. These units were also securely blocked in place. Refrigerating units were connected by means of temporary wiring to the main switchboard of the vessel and the water defrost coils were connected to the fresh water supply. In order that the critical supply of fresh water could be conserved as much as possible, the run-off from the defrost lines was led to the boiler feed water tank. Since the cooler was sealed for the thirty-three day voyage to the Persian Gulf, it was not anticipated that much defrosting of the coils would be required.

When the vessel sailed on Friday, the installation was complete and the cargo reefer contained fourteen tons of frozen beef, chicken and bacon. The freeze cooler will be offloaded upon arrival and used for dock storage. Alternating current motors and controls to convert the refrigeration units for shore use were supplied.

During installation the ship's engineer was trained in the maintenance and operation of the equipment for the voyage, and supplied with a spare parts kit, tool box, and maintenance instructions.

Reco Products Division of the Refrigeration Engineering Corporation, is now in process of building a number of welded steel, portable reefers for future shipments. These can be loaded and unloaded, by means of sling lift while completely loaded with frozen product. These cargo reefers will have a capacity of 1100 cubic feet to hold between 10 and 15 tons of frozen food stuffs, depending upon packing.

★ ★ ★

#### **H. W. Blythe Co. Moves To New Location**

**H**AVING outgrown their present location H. W. Blythe Co., moved Sept. 1st to larger quarters at 529 N. Milwaukee Ave., Chicago 22, Ill. These enlarged quarters also have frontage on Ohio St., where there is adequate parking space for the pick-up trade. Inasmuch as their new location is centrally located to all of Chicagoland, counter service is being expanded and delivery

schedules have been worked out to better serve the entire city. Inventories have been increased and new lines added to meet the demands of the trade. Mail-order facilities are also being increased to serve out-of-town customers. They invite all of their friends and customers to visit them in their new home.

★ ★ ★

#### **Delivered Prices Announced By Bush**

**E**FFECTIVE September 1, all standard catalog items in the Bush heat transfer products line have been priced delivered to the nearest freight station anywhere in the United States or Canada according to a recent announcement by James W. Hatch, president of Bush Manufacturing Company. From coast to coast and from Hudson Bay to the Mexican border prices on standard Bush heat transfer products will now be shown F.O.B. destination . . . making it no longer necessary for busy wholesalers to figure freight rates, differentials, etc. Mr. Hatch states that the company reserves the right to select the route over which the shipment will be made.

This is believed to be the first time that a low-side manufacturer has adopted a "delivered" price policy on a national basis and it is anticipated that the innovation will be received enthusiastically by the industry. As shipping regulations and requirements have become increasingly complex it has been more and more apparent that the handling of these details by experts is desirable. Wholesalers seldom have either the time or the specialized facilities to give the necessary attention to these matters and it is obvious that this new policy will do much to simplify a hitherto cumbersome and time-consuming procedure.

★ ★ ★

#### **Smithway Motor Service Expanded**

**T**HE PRODUCT Service Division of the A. O. Smith Corporation announces that it has more than 200 authorized dealer service stations across the nation to give the fastest possible service on all of its Smithway motors.





**FAN-E-FEX**  
The All-Purpose Unit  
and



**FLO-E-FEX**  
Space Saving  
Wall Unit

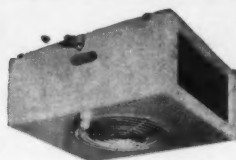
# KRACK ENGINEERED

UNIT COOLERS, FIN COILS  
AIR CONDITIONING

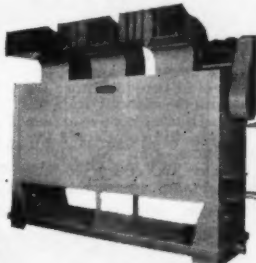
Over 112,000  
MAN HOURS

**ZER-E-FEX**  
The Low Temperature  
Water Defrost Unit

of diligent laboratory research have gone into the development of KRACK Engineered Unit Coolers. Add to this the many years of field experience compiled by KRACK Engineers and you will see how you get more for your dollar in every way when you specify a KRACK Engineered Unit Cooler on your next refrigeration application. A complete line of low-side refrigeration and air conditioning equipment from the tiny Fan-E-Fex Junior to the big Blo-E-Fex Floor Type Unit.



**STRAT-E-FEX**  
The Modern  
Ceiling Unit



**BLO-E-FEX**  
The Big Floor Unit

Write for further details and information to  
**REFRIGERATION APPLIANCES, INC.**

917-23 W. Lake St.  
Chicago 7, Ill.

## maco SNAP-ON COPPER TUBE CLIPS

FIT SNUG - HOLD TIGHT - while both hands are free to work

**VAN type HANGERS**  
Use for extra neat installation—made of all copper for tube sizes  $\frac{1}{8}$ ",  $\frac{1}{4}$ " &  $\frac{1}{2}$ " O.D. and pipe sizes  $\frac{1}{8}$ ",  $\frac{1}{4}$ " &  $\frac{1}{2}$ "

**STRAP HANGERS**  
Made of  $\frac{1}{8}$ " brass strap—Adjustable for all sizes of tubing or pipe,  $\frac{1}{8}$ " O.D. and up.

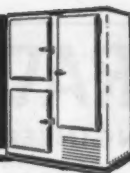
**BRASS STAPLES**  
Handy for a score of uses, especially for radiant heat installations.

A MACO exclusive in new-design tube straps that "snap" on and hold by themselves, leaving both hands free. Available for  $\frac{1}{8}$ " thru  $2\frac{1}{4}$ " O. D. tube sizes.

These and other MACO products are available through leading wholesalers, everywhere. Literature and prices available upon request.

**maco**  
**MADISON PRODUCTS COMPANY**  
EAST GREENWICH, R. I.

# " " NEW IMPROVED



# AND " " EQUIPMENT

Information in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

## Kelvinator Cabinets

**A**N entirely new line of Kelvinator ice cream cabinets, re-designed and re-engineered to provide more interior space without increasing overall size, is now in production at the company's Detroit plant. Don H. Carter, Kelvinator ice cream cabinet sales manager, announced recently.

which may be turned around to open from either side or the ends of the cabinet, offering easier access to a variety of ice cream flavors.

The two-hole cabinet is engineered for small stops, or locations where floor space is at a premium, and will also serve as a "spot" cabinet in large outlets. It has a pack-



The 1949 Kelvinator group includes five new models, from the trim two-hole model, reintroduced this year, to the large eight-hole double-row cabinet. A completely new product introduced to the ice cream trade is the big-capacity 20-cubic foot storage cabinet.

Carter said all models are lighter in weight, by as much as 220 pounds in the eight-hole cabinet, permitting savings in transportation and installation-handling costs. The double row models have new square "change-about" lids,

age capacity of 19 gallons, or 7½ gallons bulk.

There are two four-hole models, a single row for narrow areas, and a double-row cabinet for locations where compactness is desirable. The single row holds 46 gallons of packaged ice cream or 17½ bulk gallons, and provides 17% more capacity than the previous model without an increase in the required floor space. The double row occupies 22% less floor space than the previous model and holds 38 package gallons or 15 bulk gallons.

Kelvinator's six-hole double-row cabinet meets today's demand for a wide variety of flavors, bulk and package, offering 25 gallons bulk capacity or 63 gallons packaged goods. It occupies 16% less floor space than the previous model.

Designed for big volume outlets, the eight-hole double-row cabinet occupies 15% less floor space than its predecessor, and has a capacity of 88 package gallons or 35 gallons bulk.

Kelvinator's new 20-cubic-foot ice cream storage cabinet is especially designed for back room storage purposes, and has a capacity of 70 gallons bulk or 150 gallons of packaged ice cream.

All Kelvinator cabinets are equipped with the Polarsphere refrigerating unit, permanently sealed in a dome of steel, with its own lifetime supply of oil sealed in at the factory. A five-year protection plan provides a warranty and replacement contract for satisfactory operation of the Polarsphere mechanism.

## Liquid Indicators

"**W**HY don't you make a good liquid indicator—one that you can easily see into, that is positively leak-proof, and safe to use?" Hun-



dreds of refrigeration men have asked this question of Remco, Inc.

Determined to solve this problem, the company, according to them have made and discarded many designs before finally arriving at the new "E-Z-SEE" shown in the illustration.

It's easy to see through the tubular high pressure Pyrex gauge glass.

It can't leak because the springs automatically main-

## The PREMIER KIT

Reconditions Recessed or Flush  
Valve Ports in Minutes!



**Now**



See This Time and Money  
Saving Tool at Your Jobbers.  
Typical testimonial letter

### APPLIANCE SERVICE COMPANY

304 Alwine Avenue  
Greensburg, Penna.

February 10, 1948

The Premier Co.  
891 Park Ave.  
Baltimore 1, Md.

Attention: Mr. H. W. Goodhart  
Dear Sir:

I have been using the PREMIER SELF ALIGNING VALVE GRINDING KITS for the past three or four months, and would like to take this opportunity to thank you for coming out with such a tool.

Since using this kit, I do not see how I got along without it all these years. It has saved me money and valuable time in waiting for replacement parts.

Very truly yours,

APPLIANCE SERVICE COMPANY  
(signed) Paul Brandstetter

PB:ct

Service Manager

**THE PREMIER CO.**

891 PARK AVENUE • BALTIMORE 1, MD.

SERVICE ENGINEER

MAKE YOUR FUTURE  
**SECURE...**

IN AIR CONDITIONING  
AND REFRIGERATION!

\*The man who knows the groundwork . . . the man who has modern shop practice and servicing methods at his command . . . is the man equipped to get ahead in these progressive fields.

U.E.I.'s intensive, practical shop training gives you this necessary know-how in day or night classes. Non-residents may obtain fundamentals through home study in spare time followed by a short, intensive shop practice session. Either way . . . the U.E.I. course is practical and complete.

Fall Resident Classes begin  
September 27th

Civilians and veterans, get the facts before you by clipping the coupon now!

Founded in 1927



## UTILITIES ENGINEERING INSTITUTE

2525 Sheffield Avenue

Dept. 45, Chicago 14, Ill.

Please submit, without obligation, complete information on U.E.I. Air Conditioning and Refrigeration training.

Name.....

Address.....

City.....Zone.....State.....

tain just the right amount of force upon the neoprene gaskets to form a positive seal around the glass and compensate for "cold flowing," and, in addition, the refrigerant pressure applying on the gaskets assists the springs in making an even tighter seal. Hence, the higher the pressure, the tighter the seal.

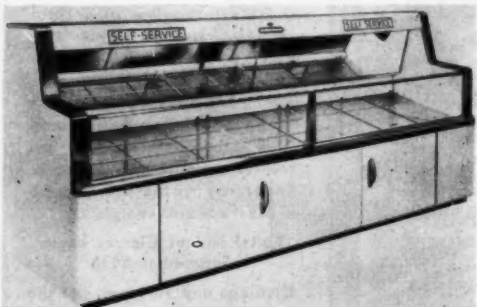
It's safe to use because the glass is protected from damage by the slotting arrange-

ment in the brass body, and, since the glass is actually "floating" in the spring compensated neoprene gaskets, it is not under stress, and therefore is perfectly safe to use at pressures up to 500 psi.

They are made in  $\frac{1}{4}$ ",  $\frac{3}{8}$ " and  $\frac{1}{2}$ " sizes with either male S.A.E. connections at both ends or male S.A.E. on one end and female S.A.E. on the other end.

## Frigidaire Products

**A** NEW self-service, normal temperature display case, designed to help speed up the merchandising tempo of fresh vegetables, meats and dairy products in groceries, markets and other food stores, has been added to the extensive case and fixture lines of Frigidaire Division of General Motors.



Designers worked on the theory that "products easy to reach, are easy to buy" when they developed the new case. Consequently shoppers can make their own selections quickly, from the open-top case, without aid from an attendant clerk.

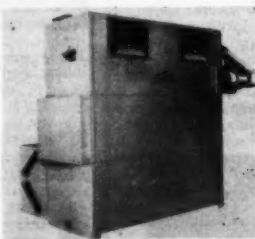
Generous storage space below holds reserve stock at proper temperatures, keeping this supply for immediate selling. This section is also ideal for overnight storage of food products. A light turns on automatically when the door to the storage section is opened.

Finished in gleaming white with a black base, stainless steel trim and chromium hardware, the case has 19 $\frac{1}{2}$  square feet of shelf display area and 28 $\frac{1}{2}$  cubic feet of

storage capacity. Twin plate-glass mirrors, fitted into the storage compartment, add to the attractiveness of the display. Lighting is afforded by fluorescent lamps.

Central system air conditioners designed and built for matched operation with Frigidaire compressors and refrigerant control valves have

been added to the air conditioning lines of Frigidaire. In addition to performing their customary summer-time job of cooling, dehumidifying, cleaning and circulating air, these units may be equipped with heating coils and dehumidifier assembly to pro-



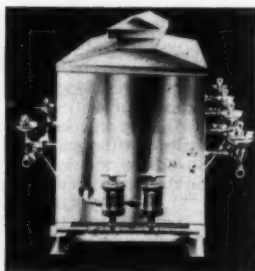
vide the benefits of air conditioning the year round.

Eight new units, including both vertical floor-type and suspended horizontal models, with nominal refrigerating capacities ranging from five to 40 tons and powerful enough to circulate from 2,400 to 9,000 cubic feet of air per minute, have been designed for business houses, institutions and industrial application. New models, equipped with either Freon or water-type Multipath cooling units, are available for use in hotels, restaurants, small theaters, stores of all kinds, hospitals and other similar establishments.

Both vertical and horizontal models are housed in sectional-type, heavy-gauge steel cabinets, finished in battle-ship grey. Insulation with an asphaltic binder applied inside insulates the cabinet against heat transfer. This combination is sound-absorbing and reduces noise. Units are installed with a sealing compound between sections, making each completely air and water tight.

Quiet slow-speed fans operate below the critical shaft speeds, reducing vibration to a minimum. Multiblade forward-curved fans have double inlets and double-width wheels mounted in oil-lubricated sleeve bearings. The fan section may be installed to discharge conditioned air in various directions as required by individual installations. The fan, itself, is powered by an electric motor, equipped with ball bearings.

## Water Cooler



**A** NEW, mobile water cooler—fresh from the Engineering Department of Filtrine Manufacturing Company, of Brooklyn, N. Y.—has

## FOR QUIET PERFORMANCE



*on your next job choose a*

# MILLS

*a condensing unit for  
every installation*

*Mills Industries, Incorporated • 4100 Fullerton Avenue • Chicago 39, Illinois*

## Cleans Condenser Units Quickly ... Completely

### IDEAL "Hand-Type" CLEANER

Here you see the Ideal "Hand-Type" Cleaner with 5" nozzle and brush attachment being used to vacuum dirt, dust and lint from the condenser unit of a frozen food dispenser in a grocery store. It's equally effective for vacuuming dirt from the inside of cabinets and other hard-to-get-at places. Powerful  $1\frac{1}{2}$  H.P. continuous duty motor removes every trace of dust, matted dirt and lint. Can also be used as a blower. Has attachments for spraying and drying. Unit is light weight, only 14½ lbs. Also available in Medium Duty size—2½ H.P., 9½ lbs. — IDEAL INDUSTRIES, Inc., Sycamore, Illinois.



*Distributed through*

**AMERICA'S LEADING WHOLESALERS**

CANADIAN DISTRIBUTOR IRVING SMITH LTD. MONTREAL

solved the problem of providing proper drinking water for large, floating industrial crews operating here and abroad.

Developed in cooperation with a major oil company the Filtrine Mobile Water Cooler, was originated as a time-saving, efficiency factor for three - hundred - man floating crews employed in oil refineries. Its function is to travel with the men and, at job location, to cool, clear, dechlorinate and provide abundant cold water for a crew of that size engaged in around-the-

clock work in tropical and sub-tropical climate. Success in its initial application immediately established the mobile cooler as a standard appliance profitably adaptable in a wide range of industries. Models now being produced by the manufacturer are for use in shipyards, mines, mills, plantations, construction projects and other industries where drinking facilities that "follow the crowd" serve to raise morale and speed the job.

## Refrigerator and Bar

**M**OSS Atlas Corp., Victor J. Moss, President, announces the manufacture of a new, table high electric refrigerator of 3.5 cubic feet capacity, designed especially for

vide for easy opening of the refrigerator door even when the unit is placed next to a wall or kitchen cabinet.

The cabinet liner is of all-welded construction finished in vitreous enamel. Exterior is finished in polished, baked white enamel over rust-proofed all-steel construction. Con-

when closed, for then it resembles a fine piece of furniture that complements the room wherein it stands.

Being but 42" high, 42" wide and 18" deep, the bar requires very little space and its compactness makes it adaptable to a wide variety of uses in the office and the home.

Raising the trap door on the serving area automatically lights up a spacious liquor storage cabinet. With bottles on the serving area, there is ample room in its 8 square feet for every bar accessory. The refrigerator is designed to afford space for tall bottles of ginger ale, club soda, etc., and makes 42 full size ice cubes.

The refrigerator section, with over 3½ cubic feet capacity, is fully equipped with evaporator, 3 self-releasing shucker trays, glass drip tray, dial temperature control, adjustable shelf rack, satin-



apartments, small homes, and wherever else space-saving refrigeration is an important factor.

Because of its small, compact size (34½" high, 24" wide and 22½" deep) the new "LO-BOY" refrigerator is especially suited to small kitchen use in apartments, small houses, tourist cabins, vacation-time bungalows, auto trailers, professional offices, etc. Dwellers in small homes find this space-saving feature an attraction, the manufacturer declares, pointing out that the "LO-BOY" can be installed flush against a stove, cabinet or wall due to special type extended hinges which pro-



finish aluminum lining and fibre glass insulation. Hermetic condensing unit is a case welded and sealed ½ h.p. AC unit.

## Home Freezer

**N**EWEST addition to the International Harvester refrigeration line is a heavy-duty home freezer, Model 15-FC — a BIG chest-type freezer with 15.8-cubic-foot capacity that stores up to 553 pounds of frozen food. Production is scheduled to begin this month at Harvester's Evansville, Ind., refrigeration works. Lighted interior and an alarm to warn of temperature rise are new Harvester features.

densing unit is a ⅓ h.p. "Freon 12" hermetic, and is available for 50 cycle or 220 volt operation, as well as the standard 110 volt, 60 cycle a.c. single phase current.

A new deluxe serving bar, a combination bar, refrigerator and liquor cabinet, is also being manufactured by Moss Atlas Corporation. It is called "The Aristocrat."

Said to be unique in that it combines the finest in cabinet making with the best in refrigeration, the new bar is finding wide favor in executive offices, show rooms and better class homes. A distinctive feature of "The Aristocrat" is its appearance



IF YOU WANT TO BE SURE YOUR PARTS ARE  
RIGHT FOR THE NEXT COLDSPOT JOB —

Ask Your Wholesaler for

## RIXCO REPLACEMENT PARTS FOR COLDSPOT UNITS

Rixco Replacement Parts are high-quality parts, engineered to factory standards of accuracy, and guaranteed 100%. Furthermore, careful testing of all parts from basic material to finished product is additional assurance that jobs serviced with Rixco Parts will deliver longer, more dependable service. So if you want to be sure your parts are right for the next Coldspot job, ask your wholesaler for Rixco Replacement Parts, or write direct giving name of your regular supplier.



### No. 150—REPLACE- MENT CHECK VALVES

1 to 9 each .....\$2.45  
10 or more ea. ....\$2.25

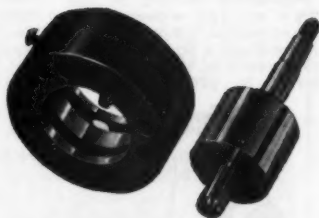


This Rixco Check Valve consists of a cage, ball, disc, and Neoprene gasket. It saves time and labor... eliminates grinding or lapping of the old seat. Every Check Valve is factory-tested. No installation tool required.



### CARBON VANES

These Vanes are quiet, easy to lap, save time for the serviceman. Carbon Vanes are standard equipment on all late model Coldspots. \$1.25 set of 4. Specify size required.



### REBUILT ROTOR BLOCK ASSEMBLIES

1/8-1/3-1/4 H.P. Large stock, precision ground and matched sets to fit all Coldspot compressors having 15/32" shafts. For immediate exchange or outright purchase. Blocks are equipped with new oil hole screw and locating pin, and complete sets are tested under actual operation.

Exchange Price, Each .....\$10.50  
Outright, Price, Each .....\$14.25

We also have available Motor Drive Couplings, Flexible Couplings, Fans, Oil Cooling Coils, Hermetic Discharge Valve Reeds, Main Compressor Bearings, and Bearing Tools.

## RIXCO DISTRIBUTING CO.

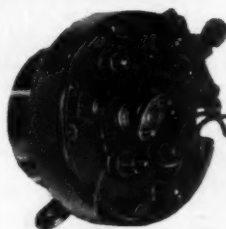
7330 Lindell

St. Louis 5, Mo.

# NOW! For Quicker, Easier Service- ing on Coldspot Jobs . . .

Guaranteed  
Ready-To-Install

## REBUILT COLDSPOT COMPRESSORS



Exch. Price All Models

**\$16<sup>50</sup>**

F.O.B. St. Louis, Mo.

Complete as illustrated

**NEW CONVENIENT EXCHANGE PLAN SPEEDS-UP COM-  
PRESSOR REBUILDING JOBS—ELIMINATES COSTLY SHOP  
WORK—ASSURES CUSTOMER SATISFACTION & PROFITS!**

HERE'S ALL YOU DO—Ship pump to be exchanged directly to us, freight prepaid, together with your check, or money order, for \$16.50, or order C.O.D. Replacement will be rushed to you same day received, freight, collect. All you have to do when replacement arrives is solder in discharge line and suction line. Missing parts, and welding or replacement of cracked casing, will be charged extra to you.



**FREE!**

35"x12 1/2" window banner imprinted with "We Repair COLDSPOT REFRIGERATORS" in large type. Write for yours today!

**LARGE STOCK ALL  
MODELS—REPLACE-  
MENTS SHIPPED SAME  
DAY RECEIVED.**

Replacements guaranteed for 1 year on pro-rata basis against material and workmanship defects.

**BEIL & COMPANY**

501 SO. FILMORE, ST. LOUIS 22, MO.

Attractive feature of the new model is the large "Freeze-Area" that occupies more than 4 square feet at the bottom of the cabinet interior to provide oversize

some, streamlined styling with Dulux enamel finish over Bonderite; all-steel welded construction; Vac-U-Seal hermetically-sealed insulation; Frost-Lok breaker strip, free



freezing capacity. Overall dimensions are 37 1/4 inches high; 73 1/2 inches wide; and 29 inches deep (excluding hardware).

Features that have distinguished all other Harvester freezers are included: hand-

of exposed fastenings; automatic temperature control; spring-counterbalanced hinges to hold lid open and provide finger-tip control. The unit is Harvester's hermetically-sealed "Tight-Wad" with a 5-year protection plan.

## Defroster

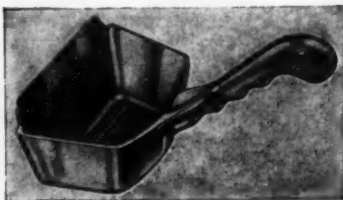
**A** NEW product to dry clean all types of low temperature cabinets in the place of usual defrosting procedures is being placed on the market throughout the nation by Marion Glass Manufacturing Company of Marion, Ohio.

Known as the "Freezer-D-Froster," the new product consists of an aluminum alloy casting, finished and polished and fitted with a cutting blade of hardened stainless steel. The blade is slightly narrower than the receptacle, enabling the Freezer-D-Froster to catch all of the frost as it is removed from the walls of the freezer.

Housewives, home economists, engineers, low temperature cabinet users and service men helped design and

test the Freezer-D-Froster over a one-year development period.

The Freezer-D-Froster,



which will be marketed at a retail price of \$2.25, will be distributed nationally and will be offered at retail through department stores, appliance stores, locker plants and other outlets.

## Tacker

**T**HERE is a new model Duo-Fast Tacker designed especially for tacking refrigerator gaskets. It is a one-hand Gun Type Tacker operated by



squeezing the handle. It has a 1/4" extended front lip so that it can reach over the rubber gasket and drive the staple just where it is needed.

## Check Valve

**W**AGNER Tool & Supply Corp., of Long Island City, N. Y., Manufacturers of "WATSCO" products, announces a newly improved replacement check valve for Coldspot and Bohn direct drive units.

The check valve assembly is completely self contained in an all brass housing that has an extended portion 1/2 inch long by .3155 diameter, this is driven into the 5/16" opening of the original check valve



seat, thus forming a pressed fit.

This cartridge type of construction offers a number of decided advantages and the only tool required is a standard threaded 5/16" bolt.



## MINI-VOLT

Instantly read voltages right off dial. 65 to 660 v. A.C. Also D.C. Virtually burnout-proof. Guaranteed for 10,000 hours' operation. Plastic case. 12" flexible test leads. *And only \$2.75 list!*

- Not only distinguishes between 110, 220 etc. volts, but measures line voltage close enough to show up to 2 or 4 volt drop between meter and load terminals on 110 v. line.

- No refrigeration serviceman need now be without definite knowledge of whether faulty operation of motors, magnetic valves, etc. is due to improper terminal voltage.

- Checks for blown fuses, accidental grounds, circuit continuity. Useful for electrical trouble-shooting in general.

- Warns of "live" wires and equipment, as protective measure.

It's a "must." Saves time, money, life and limb! Order from supplier, or from

**INDUSTRIAL DEVICES, INC.,**  
**EDGEWATER 10, N. J.**

For men who want to know more about

**AIR CONDITIONING,  
REFRIGERATION & HEATING**

Write for free booklet and class  
starting dates

**Detroit Air Conditioning Institute**  
4125 Grand River Detroit 8, Mich.

**HERVEEN** 

## The Ideal REPLACEMENT GAS for Frigidaire Meter-Miser Boxes

\* \* \*

## Representing a Field of Profits for the Serviceman

Customers and servicemen alike are finding this gas measures up to their standards of performance in Meter-Misers. Servicemen experience no difficulty in making this replacement to the complete satisfaction of their customers. Meter-Miser service becomes a routine call to the shop that carries a supply of HERVEEN.

Send for bulletin on "Procedure for Recharging Meter-Misers with HERVEEN"

For deliveries, see your  
local jobber or write to

## Conservative Gas Corporation

Modern Gas Division  
MANUFACTURERS AND REFINERS  
1084 Bedford Ave.  
Brooklyn 5, New York  
Telephone STerling 3-5750

## TRADE LITERATURE

### Alco Bulletin

**S**UCTION Line Regulators is the title of a new 20 page bulletin just issued by the Alco Valve Company, St. Louis, designers and manufacturers of automatic refrigerant control devices.

This new publication, known as Bulletin 183, is by far the most complete work on the subject of suction line control ever published in the refrigeration industry.

While primarily a catalog of Alco's line of evaporator pressure regulators, it contains complete sections on the proper selection, application, installation, adjustment and servicing of these devices. It includes descriptions of various remote pilots, both pressure and temperature types, some of them new to the industry, and of the regulators adapted to operation from an air control system as with various industrial instruments.

Copy of Bulletin 183 may be obtained without cost by writing the company at 865 Kingsland Ave., St. Louis 5, Missouri.

★ ★ ★

### Brunner Catalog

**T**HE Brunner Manufacturing Company of Utica, N. Y. have just issued a new refrigeration condenser unit Catalog No. 42. It is a 36-page book in two color, designed to provide the maximum information on con-

densing units and their application.

The first twenty pages of the book are devoted to identification of the various models produced by the company, and all the specification data on these models. Four pages are devoted to cut-away views of the compressors which provides helpful service information. Dimensional tables of various models are provided on the next three pages and the balance of the book is devoted to engineering and application data.

Copies of the catalog may be secured by writing Brunner Manufacturing Co., Utica 1, N. Y.

★ ★ ★

### New Electrimatic Catalog

**E**LECTRIMATIC has just released Refrigeration Catalog 48-25, featuring its complete line of



forged flare nuts, refrigeration fittings and brass pipe fittings, and containing many new Electrimatic products for the refrigeration and air conditioning industry. For instance, the new Electrimatic liquid indicators are

pictured, described and listed. Include in this new, larger Electrimatic catalog are charging lines, quick couplers and quick coupler elbows, strainers, driers and an oil level sight glass.

A handy index on the front cover facilitates easy use of the catalog. It is attractively printed in two colors. A copy may be had by writing to Electrimatic, 2100 Indiana Avenue, Chicago 16, Illinois. Electrimatic's complete line of precision engineered automatic control and regulating valves is listed in a separate catalog (No. 48-2) which may be had on request.

★ ★ ★

### Tal-Co Bulletin

**T**AL-CO Manufacturing Company, makers of Temprite equipped drinking fountains, have issued two new bulletins which contain highly useful information in the specification of water cooling systems for offices and other places of business.

One bulletin, Form No. TC-10, is a four-page folder showing the method of installing multiple systems of drinking fountains in office buildings. The other bulletin, Form No. TC-11, contains application and engineering data.

Included in the bulletin is a selection table, table showing the number of Btu. to be removed in cooling various quantities of water, recommended suction line sizes and liquid line sizes and complete specifications.

Both bulletins may be obtained upon request from the manufacturer at 510 North Dearborn Street, Chicago 10, Illinois.

# odorless

*Jarrow...*

Refrigerator Door Gaskets  
Are Again Made From  
Crude Rubber

Always Demand These  
Quality Gaskets

**JARROW PRODUCTS**  
420 N. LA SALLE ST. CHICAGO 10, ILLINOIS

## SHANK VALVES

### Shank COPPER DEHYDRATORS

with  
**BRASS forged  
ENDS**



2" O.D.—Copper Tubing  
with  $\frac{1}{4}$ " and  $\frac{3}{8}$ " Flare Fit-  
tings. Ends—Brass Forgings  
with large hexagon area for  
Easy Service Mounting.  
Copper Tube sweat fitted to  
forging. Brass screens and  
felt filter.

1" O.D.—Spun End Cop-  
per Tube—Brass End Fit-  
tings properly proportioned  
and silver soldered. Brass  
screens and felt filter.

If Your Jobber Doesn't  
Stock — Write Us.

**CYRUS SHANK COMPANY**  
627 W. Jackson Blvd. Chicago 6, Illinois

SERVICE ENGINEER

# Slash the "High Cost of Eating"

FOR YOUR CUSTOMERS

with

**BEN-HUR**  
FARM AND HOME  
FREEZERS



Every one among thou-  
sands of BEN-HUR  
owners will tell you  
that his freezer is his  
most profitable investment  
—it more than saves its cost  
by cutting the family's food budget—10  
to 50%. Here's your greatest opportunity  
to make hosts of friends—and sales. Show  
your prospective customer that every dollar  
he spends for the purchase of a BEN-  
HUR Farm & Home Freezer comes back  
to him—in the form of reduced food  
costs, food savings, time savings. There's  
a BEN-HUR Freezer for every family's  
need—6, 9, 12.5 and 18 cubic foot  
sizes. And every model is today's highest  
value in modern styling, food freezing  
and storage convenience and economy.  
A few territories still available. Write!

Compare them all... and you'll choose  
the Nationally-Advertised BEN-HUR  
Freezer Line.

**BEN-HUR MFG. CO.**  
DEPT. 43, 54 E. KEEFE AVE., MILWAUKEE 12, WIS.

**BEN-HUR** FARM AND HOME FREEZERS



# PERSONNEL NOTES

## Overend for Superior

**JOHN W. OVEREND** has been appointed factory sales representative of Superior Valve & Fittings Company, Pittsburgh, Pennsylvania, and will represent the Company in the states of Ohio, West Virginia, Eastern Kentucky, Eastern Michigan, Western Pennsyl-



**J. W. OVEREND**

vania, Western New York and the Province of Ontario, Canada.

Mr. Overend is a graduate of Carnegie Institute of Technology. Prior to joining the Superior organization as sales representative in the Philadelphia area he was field engineer for the A. M. Byers Co., Pittsburgh, Pennsylvania. During World War II he served as a Lt. USNR attached to the Bureau of Ships, Washington, and upon his release from service he became Eastern Zone Manager for the McAlear Mfg. Co., Controls Division of Climax Industries, Inc.

## Price Heads Penn in New York

**E. A. PRICE** has been appointed manager of the New York District Office for Penn Electric Switch Co. according to an announcement by R. H. Luscombe, general sales manager of the company. He succeeds N. E. Jennison who resigned to enter the wholesale refrigeration business.

Price was formerly manager of the company's Dayton, Ohio and Dallas, Texas districts. An experienced sales engineer with approximately 12 years experience with Penn Electric Switch Co., Price is well versed in the application of automatic controls for heating, refrigeration, air conditioning, engines, pumps and air compressors. The company's New York office will continue to be located at 101 Park Avenue, telephone Murray Hill 9-6260.

★ ★ ★

## Ebco Appoints Larrabee

**A. R. BENUA**, President of The Ebco Manufacturing Company, world's largest manufacturer of electric drinking water coolers, recently announced the selection of Duane R. Larrabee, 8901 McConnell Avenue, Los Angeles, California, as the Pacific Coast District Sales Manager for Oasis and Kelvinator Electric Drinking Water Coolers. Mr. Larrabee

succeeds John P. Rainbault, who died in June.

Mr. Larrabee's territory will include Washington, Oregon, California, Nevada, Alaska and Hawaii. He also represents the Herschede and Revere Clock Company.



**D. R. LARRABEE**

Mr. Larrabee is a veteran of many years' experience in the selling field. Before becoming affiliated with The Ebco Manufacturing Company, he was formerly with the William R. Whittaker Company, manufacturers of aircraft valves and photographic equipment; and later with the Stromberg - Carlson Company, as District Sales Manager for the West Coast.

Mr. Larrabee is a graduate of the University of Southern California. He is married and has two children.

★ ★ ★

## M. Dunn Dies

**MORRILL DUNN**, Vice President, Director, and one of the founders of McCord Corporation, passed away August 7.

Morrill Dunn was an outstanding member of the Refrigeration Industry, one of the founders of the R.E.M.A. and a man whose vision and good judgment made him



NEW • PRACTICAL • CONVENIENT  
**RAPID DEHYDRATOR KIT**

Boon to servicemen for truck storage of more of the practical sized, refillable dehydrators. Sliding drawers for replacement adapters and gaskets. Assures impressively clean packages at place of installation. Kit will soon pay for itself in saving needless return trips. See this utility item at your wholesaler's today.

**Fine PRODUCTS COMPANY**  
 185 NORTH WABASH AVENUE • CHICAGO 1, ILLINOIS



"Baking out"  
 strains...

—in Servel Supermetic crankshafts prevents compressors from getting noisy, or from binding in the bearing. This process helps build a more profitable business for you. Call your Servel distributor for full information.



Electric Refrigeration Division  
**SERVEL, INC.**  
 EVANSVILLE 20, INDIANA

**The Now Famous  
 Polyethylene Plastic**



Replacing old fashioned ice cube trays because of its many advantages.

- INSTANT RELEASE of cubes with a slight twist of the tray, no running water necessary.
- NO FORCING to remove the tray from evaporator.
- NO WASTE—remove one or any number of cubes desired.
- FLEXIBLE at all required temperatures. The ROTO TRAY is now being used by many refrigerator manufacturers.

A Patented Development of

**REPUBLIC MOLDING CORPORATION**  
 4645 W. Lexington Chicago 44, Ill.

# COMMERCIAL TRADES INSTITUTE

For Men Who Want Better Jobs in

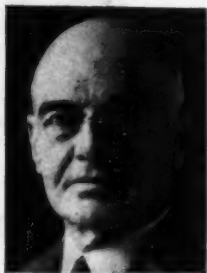
## REFRIGERATION and Air Conditioning

Full or part time residence course or combination Home Study and Shop training. (G.I. Approved.)

**COMMERCIAL TRADES INSTITUTE, Dept. A99-9**  
 1400 Greenleaf Avenue Chicago 26, Ill.

a valued member of any group with whom he was associated.

Born in 1871 at Fort Leavenworth, Kansas. Class of 1893, Harvard. He was connected with McCord Corporation since 1896.



MORRILL DUNN

During World War I, he was a Major in the Air Service and in 1918 was made a Chevalier, Legion of Honor. Well known in yachting circles from coast to coast, he was a participant in many of the national yachting events.

At the time of his death he was at the tiller of his sailboat participating in a race at Desbarats, Ontario. He is survived by his wife, sister, two daughters, and a son, Wm. McKee Dunn.

★ ★ ★

#### F. J. Hood Named Ansul President

**F. J. "JIM" HOOD**, son of the founder and first president of Ansul Chemical Company, the late F. G. Hood, was elected president of the company at a board of directors' meeting July 19. He succeeds H. V. Higley, who has been named chairman of the board of directors. Mrs. F. G. Hood, former chairman, has retired to allow

expansion of the executive branch of the business.

Jim, a past president of REMA, joined Ansul's California office in 1928. He worked in sales for eight years, returning to Marinette in 1936. In 1938 he was elected secretary and treasurer of the company. He was promoted to vice president in 1945.

Other officers elected at Ansul's board meeting were R. C. "Bob" Hood, vice president; H. C. Higley, secretary; J. F. Asell, treasurer; and S. R. Holmquist, comptroller and assistant treasurer.

Company directors are Mrs. F. G. Hood, H. V. Higley, F. J. Hood, R. C. Hood and J. F. Asell.

H. V. Higley, new board chairman, joined Ansul as chief chemist in 1919. He succeeded to the presidency in 1938, after the death of F. G. Hood.

★ ★ ★

#### Webb Appointed Betz Representative

**BETZ** Corporation, Hammond, Indiana, manufacturer of Filterpure Commercial Coils announces the appointment of Clyde L. Webb as Southwestern territory representative.

Mr. Webb comes to Betz Corporation with a background of over twenty years experience in the commercial refrigeration field. He served for a period of ten years as Sales Engineer and Field Service Supervisor for Kelvinator. Following this, he served for three years as manager of Farr-Webb Company, Houston, Texas.

During the war Mr.

Webb was with the refrigeration and air conditioning branch of the War



C. L. WEBB

Production Board. Immediately following the war, he served in an executive capacity with Surplus Property Division of the War Assets Administration.

In his new position Mr. Webb will cover Texas, Oklahoma, Arkansas, Louisiana and Mississippi with headquarters in Fort Worth, Texas.

★ ★ ★

#### Hanson Resigns

**R. KENNEDY HANSON**, executive secretary for REMA for the past several years, has resigned according to an announcement by H. F. Hildreth, REMA president.

In offering his resignation Hanson, who has served as a part time secretary, recommended that a full time trade association secretary be employed to handle the broad program of REMA. Hanson offered to continue as manager of the All-Industry Show.

The REMA board of directors, after a lengthy deliberation, accepted Hanson's letter of resignation with regrets.

# Not Merely a Source of Supply



It's an old axiom "that one can live too close to the forest to see the trees." Perhaps, too, you are overlooking the true position your REWA wholesaler occupies in relation to your business progress. Certainly he is your source of supply—but that is only one of his service functions.

## Your Local REWA Wholesaler Invites You to use his Facilities and Resources

—the next time you need help in solving a knotty problem in equipment selection. His sound helpful engineering advice on products will prove valuable.

—the next time you are confronted with a quick supply problem. His warehouse facilities with its ample stocks are at your command.

—the next time you need a sales folio to close that deal. His catalog, advertising and other promotional material will show the latest products, changes in design, prices, etc.

These services offered by your wholesaler and backed by sound operating policies of ethical trade practices assure you of protection in your business transactions.

*Over 180 wholesaler members of REWA with 300 branches across the country offer you the advantage of their facilities and invite you to consider them your buying headquarters.*



**Refrigeration Equipment Wholesalers Ass'n.**

**Association Headquarters**

**920 East McMillan St.**

**Cincinnati 6, Ohio**

### Cross Resigns From Thermal

**T**HERMAL Company, Inc. announce that Thomas F. Cross has resigned as Wisconsin Divisional Manager, and Harry J. Jessel has been appointed as Divisional Sales Manager of the Milwaukee branch store.

John Eagle continues as the store manager at Milwaukee for Thermal.

★ ★ ★

### Servel Promotes O. J. Dail

**O.** J. DAIL, formerly assistant to the executive vice-president of Servel, Inc., has been named general manager of the company's Electric Refrigeration Division.

Mr. Dail has been associated with Servel in various capacities since 1935,

when he joined the factory organization as production superintendent of the commercial refrigeration division.

In his new position he will be in charge of sales, service, engineering, and production activities of this division of the firm.

★ ★ ★

### Cherry Heads Sales of Philco Service

**J**ACK CHERRY, who has been with Philco for 14 years, has been appointed sales manager of the company's Service and Parts Division, it was announced by James M. Skinner, Jr., vice president of that division of Philco Corporation.

Mr. Cherry started in the factory organization of Philco shortly after graduation from Northeast High School, Philadelphia. He became a field service

engineer for Philco in 1939.

During the war, he was a supervisor of the radar-radio field engineers of Philco Service Division who served in all parts of the world.

In 1945, Mr. Cherry was appointed a district sales representative handling sales of electrical appliance parts and accessories in Atlanta, Ga., for the Southern Division of the company. Two years later, he was promoted to the position of field service supervisor for the company, with headquarters in Philadelphia and the responsibility for supervising the activities of all district representatives handling sales of accessories. His success in this position has led to his new position as sales manager of the Service and Parts Division.

**PERSONALIZED SERVICE**

**CHASE**

**CONVENIENT ONE-STOP SERVICE**

**CHICAGO'S OLDEST SUPPLY HOUSE**

**REFRIGERATION SUPPLY CO.**

546-48 W. 119th STREET • CHICAGO 28, ILL.

**MOVING! EXPANDING!**

**H.W. BLYTHE CO.**

We invite your inspection of our New, Larger and More Convenient Refrigeration and Air Conditioning Supply House located at—

**529 MILWAUKEE AVE.**

**Chicago 22, Illinois**

Larger Stocks, Better Parking Facilities, Speedier Service—Features of our expanded facilities.

EXPERIENCED MEN CAN SERVE YOU BEST



**COMPLETE LINE OF  
REFRIGERATION SUPPLIES  
TOOLS AND ACCESSORIES**

EACH MONTH THIS  
FELLOW APPEARS IN  
**THE LIQUID LINE**  
THE INDUSTRY'S OLDEST HOUSE ORGAN  
ARE YOU ON OUR MAILING LIST?

**WEST COAST SUPPLY JOBBERS  
SINCE 1928**

**REFRIGERATION SERVICE INC**  
3109 BEVERLY BLVD  
LOS ANGELES 4 CALIF

**AIRCO**  
offers Complete  
**CANADIAN SERVICE**  
for the following products

**ANACONDA**  
**AMERICAN**  
Copper Tubing  
**CHICAGO EYE**  
**SHIELD**

Gas Masks  
**COPELAND**  
Replacement  
Parts

**DEHAVAN**  
Perfection Parts  
**CUTLER-HAMMER**  
Controls

**DETROIT**  
**LUBRICATOR**  
Controls and  
Exp. Valves

**AUTOMATIC**  
**PRODUCTS**  
Exp. Valves

**VIRGINIA**  
**SMELTING**  
Refrigerants

**REPLACEMENT PARTS FOR MILLS,  
MAYFLOWER AND KELLOGG UNITS**

AIRCO stocks a wide variety of the well-known products you are using in your daily work. Immediate availability and ready for installation helps you to complete the sale or make repairs and replacements. Your orders receive prompt attention. Try AIRCO for one day service.

**AIRCO REFRIGERATION PARTS**

**MONTREAL**

1374 West Notre Dame

**CANADA**

**IMPERIAL BRASS**  
Valves, Driers,  
Liquid Indicators,  
Floats, Fittings,  
Tools, Charging  
and testing units,  
soldering, brazing  
& welding outfits.

**SUPERIOR**  
Valves, Driers &  
Brass Goods

**AIR COILS**  
**LIMITED**

Fin Coils &  
Blower Coils

**RANCO**  
Controls

**ROTARY SEAL**  
Seals

**VICTOR**  
Gaskets

**DAYTON RUBBER**  
Belts

**Buy From Your WHOLESALE  
PARTS—TOOLS—EQUIPMENT—SUPPLIES**



THE  
**'NEW LOOK'**  
IN  
**CATALOGS**

With its contents arranged in a new simplified way, it's easier than ever for you to order everything you need in *Refrigeration,*

*Air Conditioning and Heating  
Parts and Supplies!*

Complete stocks, speedy courteous service. Make our catalog your No. 1 time-and-energy saver!

Request this new No. 48 catalog on your letterhead today!

THE SUPPLY HOUSE THAT SERVES THE WORLD

**SERVICE**

Wholesale



Only

**PARTS CO.**

2511-2611 LAKE STREET

MELROSE PARK, ILLINOIS

**REFRIGERATION  
AIR CONDITIONING  
HEATING**

Complete Stocks of best brands for immediate delivery.  
Trade where you get the benefit of large inventories,  
wide varieties and service from men who know your requirements.

Distributor for  
**PAR** CONDENSING UNITS  
1/6 to 5 H.P. in stock

BRANCH 808 WEST 74th ST.

**WHOLESALERS**

**Automatic**  
HEATING &  
COOLING SUPPLY  
DIVISION OF HOLLAND-AMERICAN COMPANY

647 W. LAKE ST., CHICAGO 6, ILL.

*New Refrigeration  
Products*

in our

**NEW 1948 CATALOG**

**NOW READY**

(September Distribution)



Have you received  
your copy?

**THERMAL COMPANY, INC.,**

2526 University Avenue  
St. Paul 4, Minnesota

193 North Broadway  
Milwaukee 2, Wisconsin  
505 - 4th Avenue S. E.  
Cedar Rapids, Iowa

106 Eleventh Street  
Des Moines 9, Iowa  
306 First Avenue So.  
Great Falls, Montana

REFRIGERATION AND AIR CONDITIONING  
UNITS • PARTS • TOOLS • SUPPLIES

**NOW GET YOUR  
COPY OF  
CATALOG 48A**

**More Pages • New Items**



**MORE OF THE  
LINES YOU  
WANT**



Send for **YOUR**  
copy today



**Wholesale  
Only**

**AIRO SUPPLY CO.**

2732 N. ASHLAND AVE., CHICAGO 14, ILL.

**The Pacific Northwest's Largest Exclusive  
Refrigeration Parts, Products, and Supply  
Wholesaler.**



*Courteous treatment, Prompt Service  
from Six conveniently located stores*

**Refrigerative Supply, Inc.**

**VANCOUVER, B.C., CANADA**  
West 1871 Georgia St.,  
Phone Pacific 4108

**BOISE, IDAHO**  
1208 1/2 Grove St.,  
Phone 3544

**SEATTLE 1, WASH.**  
2211 5th Ave.,  
Phone Saneca 0244

**SPOKANE 8, WASH.**  
West 304 Third Ave.,  
Phone Main 3204

**TACOMA, WASH.**  
1113 Tacoma Ave.,  
Broadway 2157

**PORTLAND 14, ORE.**  
619 S.E. Sixth Ave.,  
Phone Filmore 4335





**A COPY FOR YOU!**

WHOLESALE ONLY

**Summer Edition of the DEPENDABOOK  
No. 147 Refrigeration Parts Catalog**

**THE HARRY ALTER CO.**

Please write early  
(on your own letterhead) for your copy of this newest  
edition of the most complete catalog in the business.

1728 S. MICHIGAN AVE., CHICAGO 16, ILL. • 134 LaFayette St., New York 13, N. Y.

**DISTRIBUTORS OF:**

Beverage Coolers      Milk Coolers  
Colls (All Types)      Store Fixtures  
Upright Freezers      Walk-in Coolers  
Farm and Home Freezers  
Store Air Conditioners  
Window Type Air Conditioners  
Condensing Units—1/6 to 50 H.P.

Write for Prices—prompt delivery.  
Send for our Supply Catalog on your  
letterhead.

**REPUBLIC ELECTRIC CO.**

116 E. First St.      Davenport, Iowa  
In the Refrigeration Business Since 1920

*You're* **INVITED**

COME IN AND LOOK OVER  
OUR NEW MODERN PLANT,  
FACILITIES AND STOCKS.

*We've* **PROVIDED**

COUNTER SERVICE  
PARKING FACILITIES  
LARGER STOCKS  
BETTER LOCATION

and every other convenience to  
serve you better, faster and more  
completely.

**FRED C. KRAMER CO.**

128-138 S. Paulina St., Chicago, Ill.  
Telephone TAYlor 9-2662

**GASKETS—GASKETS**



• Play safe and specify CHICAGO-WILCOX gaskets or every refrigeration need. Our complete gasket service provides a dependable source of supply to meet your requirements. Get full details today.

Write for complete catalog  
**CHICAGO-WILCOX MFG. CO.**  
7701 Avalon Ave.      Chicago 19, Illinois

**GENERAL ELECTRIC MOTORS**

For immediate delivery

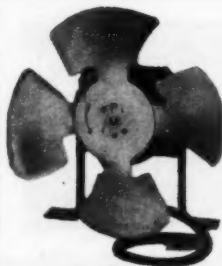
Long life totally enclosed heavy duty shaded-pole motor. 1/75 H.P., 110 Volts A.C., 50-60 Cycle, 1500 R.P.M. 2-Wire lead cord. Lifetime lubrication, quiet operation. Size 8 1/4" Dia.—4 blades with horseshoe mounting stand. Can be used in walk-in coolers, freezers, Hermetic Units, Air Conditioning, etc.

No. 9703 Suction type ea. **\$6.95**  
Lots of 12, each—\$8.80      Lots of 50, each—\$8.85

No. 9735 Blower type ea. **\$6.95**  
Lots of 12, each—\$8.80      Lots of 50, each—\$8.85

Free—Send for new G & E Appliance and Parts Catalog.

**G & E EQUIPMENT SUPPLY CO.**  
OGDEN AT FULTON, Dept. A, CHICAGO 7, ILL.



## OUTSIDE TERMINALS FOR ALL SEALED CROSLEY F-12 UNITS

*Stops Leaky Terminals in a Few Minutes Without Opening the Compressor*

No Special Tools Needed—Quickly Installed on the Job Without Removing Unit. Part No. 1020 Short Model—for Short Crosley terminals (F-12 compressors with 4 mounting legs). Part No. 1020 Long Model—for Long Crosley terminals (F-12 compressors with 3 mounting legs). Set of three terminals—\$5.25. Immediate delivery—Money back guarantee.

WRITE FOR SEALED UNIT PARTS BULLETIN No. 14

PART NO. 1150—OUTSIDE TERMINALS FOR FRIGIDAIRE, 1933 TO 1937 UNITS—\$5.25 SET OF 3

3097 Third Ave. **SEALED UNIT PARTS CO.** New York 56, N. Y.

### REBUILDING SPECIALISTS

A rebuilding service planned to suit your requirements.

Don't waste your service and installation time by reconditioning parts—send them to us; we specialize in rebuilding—

**THERMOSTATIC EXPANSION  
VALVES  
AUTOMATIC EXPANSION VALVES  
COLD CONTROLS  
WATER VALVES  
COMPRESSORS  
DEHYDRATORS**

*90-Day Guarantee on All Work  
Prompt Service*

*Wholesale*

**REFRIGERATION REPAIR CO.**

4025 Armitage Ave. Chicago 39, Ill.  
Phone CApital 7-8454

### COMPRESSOR REPLACEMENT SERVICE

Repair or replacement on Universal  
Models—also...

International	Copeland
Jomoco	Frigidaire
Crosley	Kelvinator
Lipman	Super-Cold
and Other Makes	

**90-DAY GUARANTEE—Reasonable Prices**

**Replacements on all  
standard makes shipped  
same day as received.**

*We do not repair hermetic units*

For quotations, 'phon UPTown 8-1000  
or write

**KEYSTONE ENGINEERING CORP.**  
4140 Chicago Ave. CHICAGO 51, ILL.

## LATCH-RITE KEEPS DOORS CLOSED

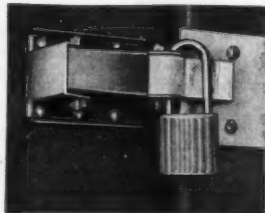
**Locks In ALL Your Precious Cold**

LATCH-RITE prevents "cold-leakage" that occurs when refrigerator doors are improperly closed. Here is a spring action latch that is completely automatic. When door is opened, LATCH-RITE snaps into position that releases pressure on door. When door is closed, LATCH-RITE resets . . . applying a constant pressure . . . sealing gasket against jamb. Can be adjusted to any desired pressure from 0 to 50 lbs. Resists door warping. Has straightened warped doors. Precision built of non-corrosive aluminum alloy. Write for descriptive literature.

**THE H. WEISSINGER CO.**

1124 N. DUNTON STREET

PHILADELPHIA 23, PA.



Can be locked in closed position  
with bicycle type pad-lock.

## FRIGIDAIRE METER-MISER



### HERMETIC REPAIR

All work done under *Factory Supervision*. \$35.00 for all Meter-Miser Units built in 1938 or later—Guaranteed one year. Price is F.O.B. our Shop.

Prices on Frigidaire Meter-Miser units prior to 1938 sent to you on application.

Write or Phone: Uptown 8-1000

*Factory Authorized Service Shop*

## NORTH TOWN REFRIGERATION CORP.

4711 Lincoln Ave.

Chicago 25, Ill.

### WEST COAST REPAIR SERVICE

One Year Guarantee  
Original Factory Specifications

#### COLD CONTROLS

Domestic .....\$2.50  
Commercial ..... 2.75

#### PRESSURE SWITCHES

Low or High .....\$2.75  
Dual ..... 3.75

#### EXPANSION VALVES

Automatic .....\$2.25  
Thermostatic .....\$3.75

#### WATER VALVES

All Makes .....\$3.00

UTILITY THERMOSTAT CO.  
4011 Halldale Ave. Los Angeles 37, Calif.

### HERMETIC REBUILDING Motor and Compressor Service

Rebuilding Hermetically Sealed  
Refrigeration units—all makes—all sizes.

Rebuilding and Rewinding  
motors and Hermetic Stators—all  
makes and all sizes.

Metalizing and Machine Shop  
work of all kinds. General job work.

ALL WORK GUARANTEED. Prompt  
service. Prices and shipping instruc-  
tions sent on request.

### BARGER REFRIGERATION SERVICE CO.

Established in 1930

WHOLESALE RETAIL

7144 Vincennes Ave.

Chicago 21, Ill.

Telephone: HUDson 3-2712

## COLDSPOT

**REBUILDING SERVICE**

**Hermetic and Open Type Units**

**One Year Guarantee**

**WRITE FOR PRICE LIST**

**SUPREME MFG. COMPANY**

**2851 East Court St.**

**Flint 7, Michigan**

**a NAME TO REMEMBER for**

## *Repairs* CONTROL REPAIR SERVICE

Gas and electric refrigeration controls  
reconditioned equal to NEW at a small  
cost. All work guaranteed for one year!

**Specialists in Electric and Gas  
Thermostatic Controls**

**YOU HAVE TRIED THE REST — NOW TRY THE BEST!**

**UNITED SPEEDOMETER REPAIR CO.**

342 West 70th Street • New York 23, N. Y.

## STATOR WINDING

for Hermetically  
Sealed Units.

All models 1/20 to 1/5  
hp. Exchange price, \$7.50  
f.o.b. Chicago.

Send old stators prepaid:  
90 day guarantee.

We do not rewind open  
type motors.

**BERDOR ELECTRIC CO.**

3609 N. Lamon Ave.

Chicago 41, Ill.



## CONTROLS — VALVES REPAIRED OR EXCHANGED

We completely disassemble controls, clean,  
test, check and replace defective or broken  
parts, and set for proper temperatures.

Domestic Cold Controls (Modern).....\$3.00  
Commercial Controls (Pres. or Temp.) 2.75  
Automatic Expansion Valves.....2.25  
Thermostatic Expansion Valves.....3.25  
Automatic Water Valves.....3.25  
90 day guarantee • Prices F.O.B. Chicago

**Refrigeration Control Service**

5056 S. Archer Ave.

Chicago 32, Ill.

Troubled with Terminal Leaks on  
**CROSLEY**

**SEALED UNITS?**

USE THE

*Jiffy Terminal*

One piece, internal  
thread design—no special  
tools

3 terminals with gaskets  
**\$4.00**



See your jobber or order direct  
**DETROIT SEALED-IN PARTS CO.**  
19191 Rogge, Detroit 12, Mich.

## COMPRESSORS REBUILT

**SIZES TO 15-TON**

Exchanges on most models up to 1 Ton.  
Emergency service when necessary.

**COLDSPOT REBUILDING**

**HERMETICS—COLDSPOT & CROSLEY**

**LARGEST AND MOST COMPLETE SHOP  
IN MICHIGAN**

**REFRIGERATION WHOLESALERS**  
Complete Stock—Parts—Tools—Supplies

**LEE EQUIPMENT COMPANY**

5422 Hamilton Ave.

Detroit 2, Mich.

## RECORDING INSTRUMENTS of Air Temperature and Motor Operation

These instruments take the guesswork out of trouble-shooting on any  
type of refrigeration equipment. With them you can automatically  
chart a written record of the true performance of the equipment you  
are servicing in the home, store, or cold storage plant. Such charts,  
taken before and after the job, are good proof of work well done.

*Tempscribe* styles for refrigeration service:

**Temperature Ranges:** — 20° to + 40° F., or — 10° to + 50° F.

**Operation Recorder:** either Type D for series connection up to 250 volts,  
or Type C for parallel connection up to 250 volts.

Ask your jobber about *TEMPSCRIBE* or write for Bulletin 731.

**BACHARACH INDUSTRIAL INSTRUMENT CO., 7000 BENNETT ST. • PITTSBURGH 8, PA.**



## Classified Ads

Rate: \$2.50 for fifty words or less, 40 cents for each additional ten words or less.

**FOR SALE**—Good, going Refrigeration Service business. Three man shop. Overhead low. Shop fully equipped and well stocked; also 1/2 ton 1938 Ford panel truck. Plenty of domestic and commercial work. Real opportunity for two eager "beavers" for small investment. Write P.O. Box 1417, Santa Barbara, Calif.

**POSITION WANTED**—in refrigeration service or sales. Have had 23 years active experience in the refrigeration industry in the capacity of service, commercial sales and operation of own business for 17 years. Am a member of RSES, NARC and ASRE. Must locate in Los Angeles area shortly after first of year. Will consider proposition from commercial sales or jobber outlets. Address Box SP-2, The Refrigeration Service Engineer, 433 N. Waller Ave., Chicago 44, Ill.

**WANTED—FOR EMPLOYMENT** in the Republic of Panama, a well qualified service mechanic with Domestic, Commercial Refrigeration and small Packaged Air Conditioner maintenance experience. Must have own tools. Good salary, contract for two years, yearly vacation with pay. Fare to Panama from port of embarkation. Single applicant preferred. Submit complete resume of past experience and qualifications, with photograph in first letter. Address Box SP-4, the Refrigeration Service Engineer, 433 N. Waller Ave., Chicago 44, Ill.



### IT'S EASY TO SPOT WHAT'S WRONG

With this vestpocket Calculator you can quickly determine the correct head pressure when the suction pressure and refrigerant are known.

POSTPAID \$1.00

**NICKERSON & COLLINS CO.**

435 N. WALLER, CHICAGO 44, ILL.

## SUBJECT TO PRIOR SALE

Universal Cooler Hermetics  
 1/4 H.P. \$42.00. Lots of 10 units \$39.00 ea.  
 1/5 H.P. \$47.50. Lots of \$45.00 ea.  
 1/4 H.P. Light duty \$59.50. Lots of 10 \$57.50 ea.  
 1/4 H.P. Capacitor, Heavy duty, \$65.00. Lots of 10 \$63.50 ea.  
 1/4" O.D.S. Henry packless 2 way valves \$2.00  
 3/8" and 1/2" flare Kerotest packed line valve .85  
 Heavy duty Mueller Freon relief valves 3/4" O.D.S. 2.00  
 Filter Drier—Silica Gel 1/4" flare 1 1/4"x6 1/4". Lots of 10 .65  
 U. S. Freon Gauge—1 1/2" case—150# and 300# corresponding temp. scaled warning hand-mounting holes... 4.50  
 U. S. Freon Gauge—2 1/2" case—100# compound, Recal-mounting holes... 1.25  
 Frigidaire Leak Detector... 3.50  
 Model W. 10 Kramer-Trenton panel blower 1/2 ton 38.00  
 Kason heavy duty cooler locks, adj., offset 13 1/2" overall. Complete with hinges and master lock and keys 9.50  
 Frigidaire Type Y.L. Low pressure control 4.25  
 F.O.B. Chicago. Send for complete listing.

Write, Wire or Phone

**WALTER W. STARR**

Bittersweet 8269

Commercial—Marine Refrigeration  
 1207 George Street Chicago

### HELP WANTED SERVICE AND INSTALLATION MECHANICS

Air conditioning and refrigeration mechanics wanted for service and installation. Minimum of two years experience on large and small installations, no domestic. Steady work for right men with the South's largest distributor.

Apply by letter giving previous experience and qualifications.

**HILL YORK CORPORATION**

1225 S. W. 8th Street  
 MIAMI, FLORIDA

## AIR CONDITIONING SERVICE MANAGER

Wanted a Regional Service Manager by an established company manufacturing air conditioners with national distribution. Applicant must have good typical background, refrigeration experience and should be able to conduct good distributor and service training. Write giving experience. Box SP-3, R.S.E., 433 North Waller, Chicago 44, Ill.



Aerovox Corp. ....	101	Kelvinator (Div., Nash-Kelvinator Corp.) ..	11
Airco Refrigeration Parts .....	121	Keystone Engineering Corp. ....	124
Airo Supply Co. ....	122	Kinetic Chemicals, Inc. ....	28
Alco Valve Co. ....	9	Kold-Hold Manufacturing Co. ....	15
Allin Mfg. Co. ....	103	Kramer Co., Fred Co. ....	123
Alter Co., The Harry .....	123	Kramer-Trenton Co. ....	25
Ansul Chemical Co. ....	1	Lee Equipment Co. ....	126
Automatic Heating & Cooling Supply Co. ....	122	Lynch Corp. ....	69
Automatic Products Co. ....	64 and 65		
		Madison Products Co. ....	105
Bacharach Industrial Instrument Co. ....	126	Marsh Corporation, Jas. P. ....	75
Barger Refrigeration Service .....	125	McIntire Connector Co. ....	73
Beil & Co. ....	111	Mechanical Enterprises .....	79
Ben-Hur Mfg. Co. ....	115	Mills Industries, Incorporated .....	109
Berdor Electric Co. ....	126	Mueller Brass Co. ....	85
Betz Corp. ....	67		
Blythe Co., H. W. ....	120	North Town Refrigeration Corp. ....	125
Black, Sivals & Bryson, Inc. ....	18		
		Peerless of America, Inc. ....	17
Chase Refrigeration Supply Co. ....	120	Penn Electric Switch Co. ....	91
Chemical Solvent Co. ....	8	Premier Co., The .....	107
Chicago Seal Co. ....	Inside Front Cover		
Chicago-Wilcox Manufacturing Co. ....	123	Ranco, Inc. ....	26
Colson Equip. & Supply Co. ....	101	Refrigeration Appliances, Inc. ....	105
Commercial Trades Institute. ....	117	Refrigeration Control Service .....	126
Conservative Gas Corporation		Refrigeration Equip. Wholesalers Ass'n. ....	119
(Modern Gas Division) .....	113	Refrigeration Service, Inc. ....	121
Crosley (Div., Avco Mfg. Corp.) ....	4 and 5	Refrigerative Supply, Inc. ....	122
Cutler-Hammer, Inc. ....	13	Remco, Incorporated .....	93
		Republic Electric Co. ....	123
Davison Chemical Corp.—Inside Back Cover		Republic Molding Corporation .....	117
Delavan Manufacturing Co. ....	20	Rixco Distributing Co. ....	111
Detroit Air Conditioning Institute. ....	113		
Detroit Lubricator Co. ....	2 and 3	Schnacke, Inc. ....	99
Detroit Sealed-In Parts Co. ....	126	Sealed Unit Parts Co. ....	124
Du Pont de Nemours & Co., Inc., E. I.		Servel, Inc. ....	117
Electrochemicals Dept. ....	77	Service Parts Co. ....	121
Duro Metal Products Co. ....	23	Shank Co., Cyrus .....	115
		Simpson Electric Co. ....	95
Electrimatic .....	71	Smith Corp., A. O. ....	16
		Sporlan Valve Co. ....	7
Fine Products Co. ....	117	Stangard (Div., Norma Electric Corp.) ....	12
		Standard Refrigeration Co. ....	81
G & E Equipment Supply Co. ....	123	Starr, Walter W. ....	127
General Controls .....	10	Supreme Mfg. Co. ....	126
General Electric Co. ....	24		
		Temprite Products Corp. ....	22
Halstead & Mitchell .....	19	Thermal Co., Inc. ....	122
Henry Valve Co. ....	6		
Hill York Corporation .....	127	Ultra-Violet Products, Inc. ....	103
Highside Chemicals Co. ....	21	United Speedometer Repair Co. ....	126
Howe Ice Machine Co. ....	99	Utilities Engineering Institute. ....	107
		Utility Thermostat Co. ....	125
Ideal Industries, Inc. ....	109	Virginia Smelting Co. ....	87
Imperial Brass Mfg. Co., The .....	14		
Industrial Devices, Inc. ....	113	Wagner Electric Corp. ....	83
		Wagner Tool & Supply Corp. ....	89
Jack & Heintz Precision Industries Co. ....	30	Weissinger Co., The H. ....	124
Jarrow Products .....	115	White-Rodgers Electric Co. ....	Back Cover
		Wholesale Refrigeration Repair Co. ....	124





1. maximum capacity . . . 2. instant action . . . 3. removal of acids and corrosive compounds . . . 4. freedom from caking . . . 5. freedom from channeling of refrigerant . . . 6. will not attack metals or alloys . . . 7. dust-free drying. . . No wonder more leading service engineers demand

PA 100 for all their refrigerant drying needs . . . Your jobber stocks PA 100.



. . . in the can with the blue label and in dehydrators charged by the cartridge manufacturer.

U. S. PAT. REG. APP. FOR

*Progress through Chemistry*



**THE DAVISON CHEMICAL CORPORATION**

BALTIMORE-3, MD.

**PIONEERS AND DEVELOPERS OF SILICA GEL**

Canadian exclusive sales agents for DAVISON SILICA GEL:

CANADIAN INDUSTRIES LIMITED, Sales Division, Chemical Group

No wonder we installers  
like WHITE-RODGERS controls



There's no waiting to check settings...  
just set them and go on to the next job

Easy-to-read, visible dials, accurately calibrated in degrees Fahrenheit or pounds pressure, make installation and adjustment of White-Rodgers automatic refrigeration controls quick and easy.

When you're responsible for the operation of equipment, it's well to remember that such equipment can be only so good as the controls that make it work. That's why more and more manufacturers are standardizing on White-Rodgers refrigeration and air-conditioning controls. White-Rodgers Electric Company, St. Louis 6, Missouri.



**WHITE-RODGERS**  
**Controls**  
FOR REFRIGERATION  
HEATING AND  
AIR CONDITIONING